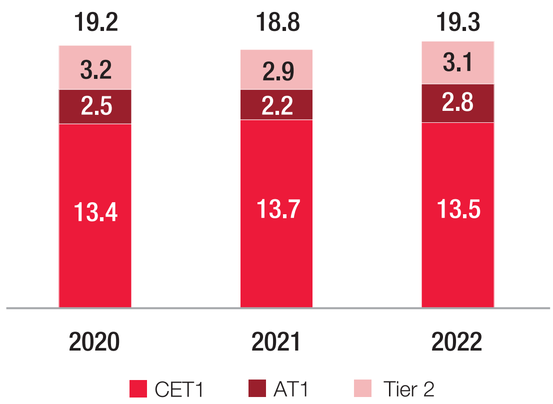
4

RISK AND CAPITAL ADEQUACY

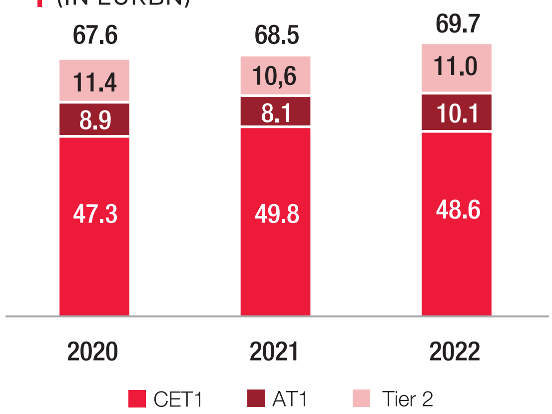
KEY FIGURES

The solvency and leverage prudential ratios, as well as the amounts of regulatory capital and RWA featured here take into account the IFRS 9 phasing (fully-loaded CET1 ratio of 13.34% at end 2022, the phasing effect being +17 bps) and the effects of the ECB's Covid-19 transitional measures ending on 31 December 2022.

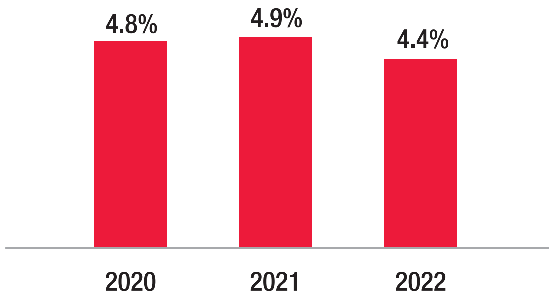
SOLVENCY RATIOS
(IN %)



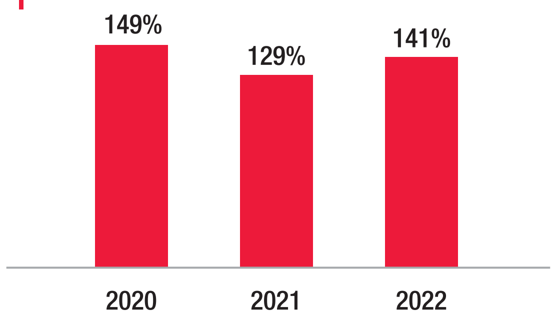
REGULATORY CAPITAL
(IN EURBN)



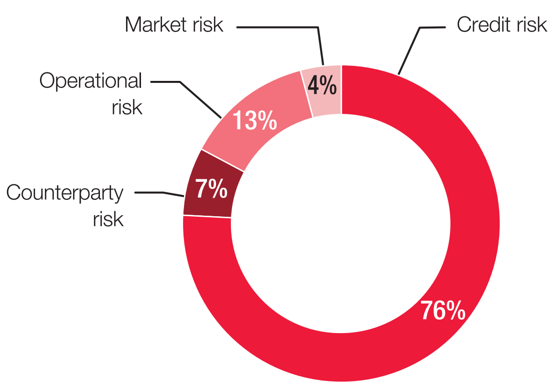
LEVERAGE RATIO



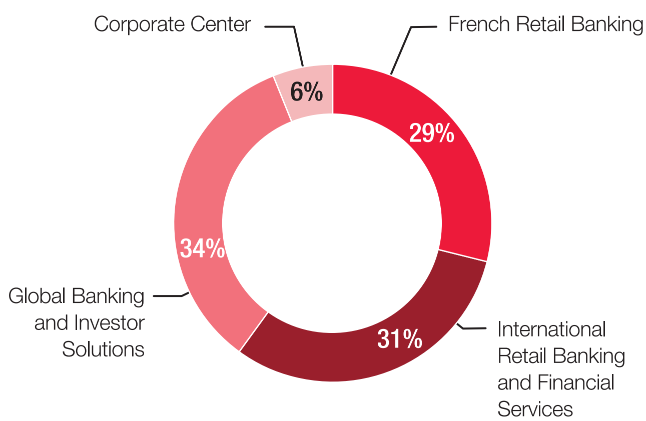
LCR RATIO



DISTRIBUTION OF RWA BY RISK TYPE
(TOTAL RWA AT END 2022: EUR 360BN *VS.* EUR 363BN AT END 2021)



DISTRIBUTION OF RWA BY CORE BUSINESS
(TOTAL RWA AT END 2022: EUR 360BN *VS.* EUR 363BN AT END 2021)

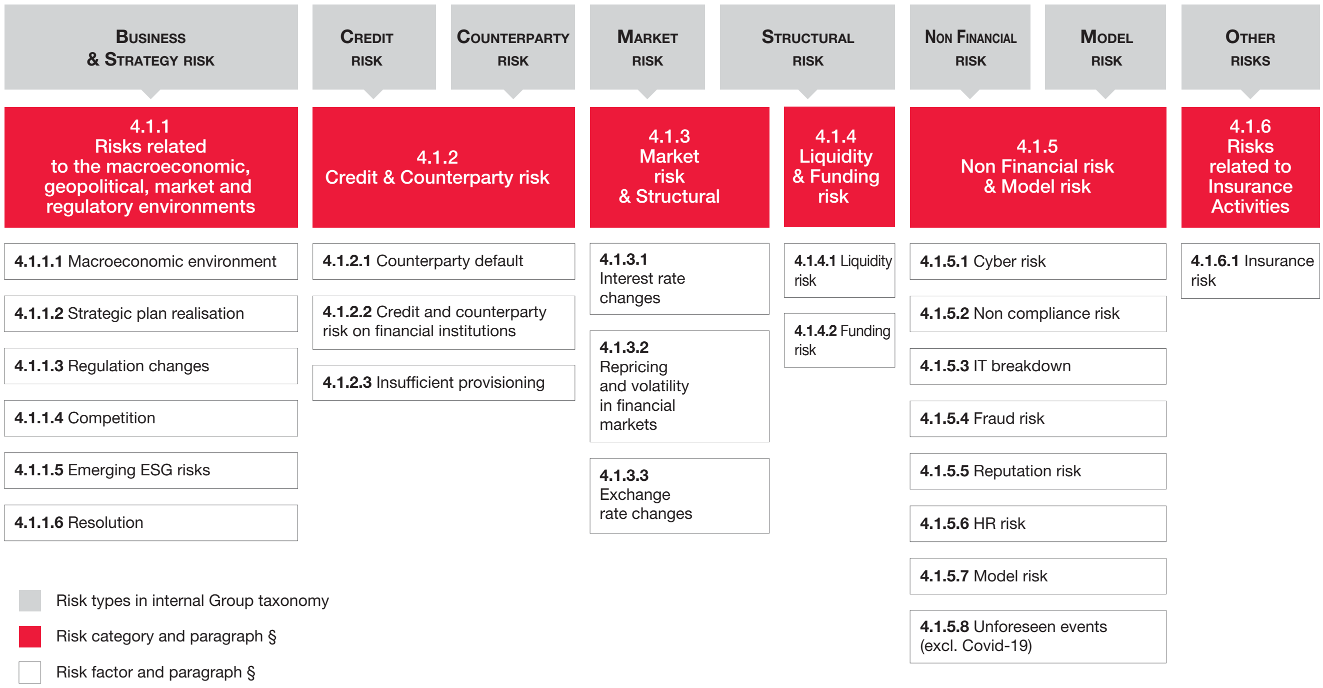


4.1 RISK FACTORS BY CATEGORY

This section identifies the main risk factors that the Group estimates could have a significant effect on its business, profitability, solvency or access to financing.

As part of its internal risk management, Societe Generale has updated its risk typology. For the purposes of this section, these different types of risks have been grouped into six main categories (4.1 to 4.1.6), in accordance with Article 16 of the Regulation (EU) 2017/1129, also known as "Prospectus 3" regulation of 14 June 2017, according to the main risk factors that the Group believes could impact the risk categories. Risk factors are presented based on an evaluation of their materiality, with the most material risks indicated first within each category.

The diagram below illustrates how the categories of risks identified in the risk typology have been grouped into the six categories and which risk factors principally impact them.



Note to the reader: the diagram illustrates how the types of risks identified in the Group's risk typology have been grouped into the six categories and which risk factors mainly impact them.

4.1.1 RISKS RELATED TO THE MACROECONOMIC, GEOPOLITICAL, MARKET AND REGULATORY ENVIRONMENTS

4.1.1.1 The global economic and financial context, geopolitical tensions, as well as the market environment in which the Group operates, may adversely affect its activities, financial position and results of operations.

As a global financial institution, the Group's activities are sensitive to changes in financial markets and economic conditions generally in Europe, the United States and elsewhere around the world. The Group generates 49% of its business in France (in terms of net banking income for the financial year ended 31 December 2022), 32% in Europe, 7% in the Americas and 12% in the rest of the world. The Group could face significant deteriorations in market and economic conditions resulting from, in particular, crises affecting capital or credit markets, liquidity constraints, regional or global recessions and fluctuations in commodity prices (notably oil and natural gas). Other factors could explain such deteriorations, such as variations in currency exchange rates or interest rates, inflation or deflation, rating downgrades, restructuring or defaults of sovereign or private debt, or adverse geopolitical events (including acts of terrorism and military conflicts). In addition, the Covid-19 crisis continues to have an impact mainly in China, where the so-called "Zero Covid" policy has begun to be relaxed. Such events, which can develop quickly and whose effects may not have been anticipated and hedged, could affect the Group's operating environment for short or extended periods and have a material adverse effect on its financial position, cost of risk and results of operations.

The economic and financial environment is exposed to intensifying geopolitical risks. The war in Ukraine which began in February 2022 has led to high tensions between Russia and Western countries, with significant impacts on global growth, energy and raw materials prices, as well as on a humanitarian level. The economic and financial sanctions imposed by a large number of countries, particularly in Europe and the United States, against Russia and Belarus could significantly affect operators with direct or indirect links to Russia, with a material impact on the Group's risks (credit and counterparty, market, reputation, compliance, legal, operational, etc.). The Group will continue to analyse in real time the global impact of this crisis and to take all necessary measures to comply with applicable regulations.

In Asia, US-China relations are fraught with trade tensions and the risk of technological fractures.

After a long period of low interest rates, the current inflationary environment is leading the major central banks to raise rates. The entire economy will need to adapt to a context of higher interest rates. In addition to the impact on the valuation of equities, interest rate-sensitive sectors such as real estate will have to adjust. The US Federal Reserve and the European Central Bank (ECB) are expected to continue to tighten monetary conditions in the first half of 2023 before taking a break as inflation recedes according to our predictions. In the meantime, inflation in the US and Europe continues to impact the price of services, food and energy.

This crisis could generate strong volatility on the financial markets and a significant drop in the price of certain financial assets, potentially leading to payment defaults, with consequences that are difficult to anticipate for the Group. In France, after the long period of low interest rates which fostered an upturn of the housing market, a reversal of activity in this area could have an adverse effect on the Group's asset value and on business, by decreasing demand for loans and resulting in higher rates of non-performing loans. More generally, the higher interest rates environment in a context where public and private debts have tended to increase is an additional source of risk.

Considering the uncertainty generated by this situation, both in terms of duration and scale, these disruptions could persist throughout 2023 and have a significant impact on the activity and profitability of certain Group counterparties.

Against the backdrop of the continuing war in Ukraine, the reduction in Russian gas imports and the introduction of an embargo on Russian oil on 5 December 2022, the European energy sector is facing a more difficult and uncertain situation. Gas prices have risen and remain highly volatile. A total halt in Russian gas supplies combined with a post-Covid-19 economic recovery in China could lead to a further spike in gas prices, affecting European economic growth.

In the longer term, the energy transition to a "low-carbon economy" could adversely affect fossil energy producers, energy-intensive sectors of activity and the countries that depend on them.

With regard to financial markets, in the context of Brexit, the topic of non-equivalence of clearing houses (central counterparties, or CCPs) remains a point of vigilance, with possible impacts on financial stability, notably in Europe, and therefore on the Group's business. In addition, capital markets (including foreign exchange activity) and securities trading activities in emerging markets may be more volatile than those in developed markets and may also be vulnerable to certain specific risks, such as political instability and currency volatility. These elements could negatively impact the Group's activity and results of operations.

On the mobility market, due to the shortage of new car supply, demand for used vehicles has risen, pushing up resale prices sharply. As a result, ALD has recorded a historically high result on used vehicle sales for the past year. The Group is exposed to a potential loss in a financial year from (i) resale of vehicles related to leases which expire during the period whose resale value is lower than their net carrying amount and (ii) additional impairment during the lease period if residual value drops below contractual residual value. Future sales and estimated losses are impacted by external factors such as macroeconomic conditions, government policies, tax and environmental regulations, consumer preferences, new vehicle prices, etc. The Group anticipates for 2023 that supply chains may not return to normal immediately, which could support the resale prices of used vehicles.

The Group's results are therefore exposed to the economic, financial, political and geopolitical conditions of the main markets in which the Group operates.

4.1.1.2 The Group's failure to achieve its strategic and financial objectives disclosed to the market could have an adverse effect on its business, results of operations and the value of its financial instruments.

The Group is fully on track to achieving its strategic milestones and has set targets for profitable and sustainable growth out to 2025 with:

- average annual revenue growth of 3% or greater over the 2021-2025 period by focusing on growth in the most profitable businesses;
- an improved cost to income ratio equal to or lower than 62% in 2025 and ROTE of 10% based on a targeted CET1 ratio of 12% in 2025;
- disciplined management of scarce resources, in addition to keeping a tight rein on risks, will help strengthen and improve the quality of the Bank's balance sheet;
- stringent loan portfolio management with cost of risk of around 30 basis points in 2025;
- increased use of new technologies and digital transformation;
- commitments in Environmental, Social and Governance areas.

More precisely, the Group's "Vision 2025" project anticipates the merger between the Retail Banking network of Societe Generale in France and Crédit du Nord. Although this project has been designed to achieve controlled execution, the merger could have a short-term material adverse effect on the Group's business, financial position and costs. System reconciliations could undergo delays, thereby postponing part of the expected merger benefits. The project could lead to some staff departures, requiring replacements and training efforts which could potentially generate additional costs. The merger could also lead to the departure of some of the Group's customers, resulting in loss of revenue. The legal and regulatory aspects of the transaction could prompt delays and additional costs.

Following ALD's announcement on 6 January 2022 of its plan to acquire LeasePlan, Societe Generale and ALD announced on 22 April 2022 the signing of a framework agreement, with the aim of creating a global leader in mobility solutions. The acquisition is notably subject to receiving certain regulatory approvals and to the performance of other standard conditions precedent.

The Group also announced in November 2022 the signing of a letter of intent with AllianceBernstein to combine the equity research and execution businesses in a joint venture to create a leading global franchise in these activities. This announcement was followed by the signature of an acquisition agreement in early February 2023.

The conclusion of final agreements on these strategic transactions depends on several stakeholders and, accordingly, is subject to a degree of uncertainty. The inability to close on the transactions would not have an immediate impact on the Group's activity, but could potentially weigh on the share price, at least temporarily.

Societe Generale has placed Environmental, Social and Governance (ESG) at the heart of its strategy in order to contribute to positive transformations in the environment and the development of local regions. In this respect, the Group has made a certain number of commitments (see Chapter 2, page 46 and following and Chapter 5, page 291 and following). Failure to comply with these commitments, and those that the Group may make in the future, could harm its reputation. Furthermore, the rollout of these commitments may have an impact on the Group's business model. Last, failure to make specific commitments could also generate reputation and strategic risk.

The Group may face execution risk on these strategic projects, which are to be carried out simultaneously. Any difficulty encountered during the process of integrating the activities (particularly from a human resources standpoint) is likely to generate higher integration costs and lower-than-anticipated savings, synergies and benefits. Moreover, the process of integrating the acquired operational businesses into the Group could disrupt the operations of one or more of its subsidiaries and divert General Management's attention, which could have a negative impact on the Group's business and results.

4.1.1.3 The Group is subject to an extended regulatory framework in each of the countries in which it operates and changes to this regulatory framework could have a negative effect on the Group's businesses, financial position and costs, as well as on the financial and economic environment in which it operates.

The Group is subject to the laws of the jurisdictions in which it operates. This includes French, European and US legislation as well as other local laws in light of the Group's cross-border activities, among other factors. The application of existing laws and the implementation of future legislation require significant resources that could affect the Group's performance. In addition, possible failure to compliance with laws could lead to fines, damage to the Group's reputation, force the suspension of its operations or, in extreme cases, the withdrawal of operating licences.

Among the laws that could have a significant influence on the Group:

- several regulatory changes are still likely to significantly alter the framework for Market activities: (i) the possible strengthening of transparency constraints related to the implementation of the new requirements and investor protection measures (review of MiFID II/MiFIR, IDD, ELTIF (European Long-Term Investment Fund Regulation)), (ii) the implementation of the fundamental review of the trading book, or FRTB, which may significantly increase requirements applicable to European banks and (iii) possible relocations of clearing activities could be requested, despite the European Commission's decision of 8 February 2022 to extend the equivalence granted to UK central counterparties until 30 June 2025;
- new requirements resulting from the EU banking regulation reform proposal presented on 27 October 2021 by the European Commission. The reform consists of several legislative instruments to amend the directive on capital requirements (European Parliament and EU Council, Directive 2013/36/EU, 26 June 2013) as well as the regulation on capital requirements (CRR) (European Parliament and EU Council, regulation (EU) No. 575/2013, 26 June 2013);
- in the United States, the implementation of the Dodd-Frank Act has almost been finalised. The Securities and Exchange Commission's (SEC) regulations relating to security-based swap dealers have been implemented and Societe Generale has been registered with the SEC as a Securities Based Swap Dealer;
- european measures aimed at restoring banks' balance sheets, especially through active management of non-performing loans ("**NPLs**"), which are leading to a rise of prudential requirements and an adaptation of the Group's strategy for managing NPLs. More generally, additional measures to define a framework of good practices for granting (*e.g.*, loan origination orientations published by the European Banking Authority) and monitoring loans could also have an impact on the Group;
- the strengthening of data quality and protection requirements and a future strengthening of cyber-resilience requirements in relation to the adoption by the Council on 28 November 2022, which completes the legislative process, of the European directive and regulation package on digital operational resilience for the financial sector;
- the implementation of the European sustainable finance regulatory framework, with an increase in non-financial reporting obligations, enhanced inclusion of environmental, social and governance issues in risk management activities and the inclusion of such risks in the supervisory review and assessment process (Supervisory Review and Evaluation Process, or SREP);
- the strengthening of the crisis prevention and resolution regime set out in the Bank Recovery and Resolution Directive of 15 May 2014 ("BRRD"), as revised, which gives the Single Resolution Board ("SRB") the power to initiate a resolution procedure towards a credit institution when the point of non-viability is considered reached. In this context, the SRB could, in order to limit the cost to the taxpayer, force some creditors and the shareholders of the Group to incur losses in priority. Should the resolution mechanism be triggered, the Group could, in particular, be forced to sell certain of its activities, modify the terms and conditions of the remuneration of its debt instruments, issue new debt instruments, accept a depreciation of its debt instruments or convert them into equity securities. New legal and regulatory obligations could also be imposed on the Group in the future, such as:
  - the ongoing implementation in France of consumer-oriented measures affecting retail banking,
  - the potential requirement at the European level to open more access to banking data to third-party service providers,
  - new obligations arising from a package of proposed measures announced by the European Commission on 20 July 2021 aiming to strengthen the European supervisory framework around the fight against money laundering and terrorist financing, as well as the creation of a new European agency to fight money laundering;
- from 2023, new regulatory texts will enter into force concerning rate risk of Banking Book (stress on IM, caps on maturity of deposits flows, etc.) and credit rate of banking portfolio. These new texts could constrain certain aspects of rate and credit risk monitoring.

The Group is also subject to complex tax rules in the countries where it operates. Changes in applicable tax rules, uncertainty regarding the interpretation of certain evolutions or their effects may have a negative impact on the Group's business, financial position and costs.

Moreover, as an international bank that handles transactions with US persons, denominated in US dollars, or involving US financial institutions, the Group is subject to US regulations relating in particular to compliance with economic sanctions, the fight against corruption and market abuse. More generally, in the context of agreements with US and French authorities, the Group largely implemented, through a dedicated programme and a specific organisation, corrective actions to address identified deficiencies and strengthen its compliance programme. In the event of a failure to comply with relevant US regulations, or a breach of the Group's commitments under these agreements, the Group could be exposed to the risk of (i) administrative sanctions, including fines, suspension of access to US markets, and even withdrawals of banking licences, (ii) criminal proceedings, and (iii) damage to its reputation.

4.1.1.4 Increased competition from banking and non-banking operators could have an adverse effect on the Group's business and results, both in its French domestic market and internationally.

Due to its international activity, the Group faces intense competition in the international and local markets in which it operates, whether from banking or non-banking actors. As such, the Group is exposed to the risk of not being able to maintain or develop its market share in its various activities. This competition may also lead to pressure on margins, which would be detrimental to the profitability of the Group's activities.

Consolidation in the financial services industry could result in the competitors benefiting from greater capital, resources and an ability to offer a broader range of financial services. In France and in the other main markets where the Group operates, the presence of major domestic banking and financial actors, as well as new market participants (notably neo-banks and online financial services providers), has increased competition for virtually all products and services offered by the Group. New market participants such as "fintechs" and new services that are automated, scalable and based on new technologies (such as blockchain) are developing rapidly and are fundamentally changing the relationship between consumers and financial services providers, as well as the function of traditional retail bank networks. Competition with these new actors could be exacerbated by the emergence of substitutes for central bank currency (crypto-currencies, digital central bank currency, etc.), which themselves carry risks.

Moreover, competition is also enhanced by the emergence of non-banking actors that, in some cases, may benefit from a regulatory framework that is more flexible and in particular less demanding in terms of equity capital requirements.

To address these challenges, the Group has implemented a strategy, in particular with regard to the development of digital technologies and the establishment of commercial or equity partnerships with these new actors (such as Lumo, the platform offering green investments, or Shine, the neobank for professionals). In this context, additional investments may be necessary for the Group to be able to offer new innovative services and to be competitive with these new actors. This intensification of competition could, however, adversely affect the Group's business and results, both on the French market and internationally.

4.1.1.5 Environmental, social and governance (ESG) risks, in particular related to climate change, could have an impact on the Group's activities, results and financial situation in the short-, medium- and long-term.

Environmental, social and governance (ESG) risks are defined as risks stemming from the current or prospective impacts of ESG factors on counterparties or invested assets of financial institutions. ESG risks are seen as aggravating factors to the traditional categories of risks (credit risks, counterparty risks, market risks, structural risks (including liquidity and funding risks), operational risks, reputational risks, compliance risks and risks related to insurance activities) and are likely to impact the Group's activities, results and financial position in the short, medium and long-term.

The Group is thus exposed to environmental risks, and in particular climate change risks through certain of its financing, investment and service activities. Concerning climate risks, a distinction is made between (i) physical risk, with a direct impact on entities, people and property stemming from climate change and the multiplication of extreme weather events; and (ii) transition risk, which results from the process of transitioning to a low-carbon economy, such as regulatory or technological disruptions or changes in consumer preferences.

The Group could be exposed to physical risk resulting from a deterioration in the credit quality of its counterparties whose activity could be negatively impacted by extreme climatic events or long-term gradual changes in climate, and through a decrease in the value of collateral received (particularly in the context of real estate financing in the absence of guarantee mechanisms provided by specialised financing companies).

Beyond the risks related to climate change, risks more generally related to environmental degradation (such as the risk of loss of biodiversity) are also aggravating factors to the Group's risks. The Group could notably be exposed to credit risk on a portion of its portfolio, linked to lower profitability of some of its counterparties due, for example, to increasing legal and operating costs (for instance due to the implementation of new environmental standards).

In addition, the Group is exposed to social risks, related for example to non-compliance by some of its counterparties with labour rights or workplace health and safety issues, which may trigger or aggravate reputational and credit risks for the Group.

Similarly, risks relating to governance of the Group's counterparties and stakeholders (suppliers, service providers, etc.), such as an inadequate management of environmental and social issues, could generate credit and reputational risks for the Group.

Beyond the risks related to its counterparties or invested assets, the Group could also be exposed to risks related to its own activities. Therefore, the Group is exposed to physical climate risk with respect to its ability to maintain its services in geographical areas impacted by extreme events (floods, etc.).

The Group also remains exposed to specific social and governance risks, relating for example to the operational cost of implementation of regulations related to labour laws and the management of its human resources.

All of these risks could have an impact on the Group's business, results and reputation in the short, medium and long term.

4.1.1.6 The Group is subject to regulations relating to resolution procedures, which could have an adverse effect on its business and the value of its financial instruments.

The BRRD and Regulation (EU) No. 806/2014 of the European Parliament and of the Council of the European Union of 15 July 2014 (the Single Resolution Mechanism, or "SRM") define a European Union-wide framework for the recovery and resolution of credit institutions and investment firms. The BRRD provides the authorities with a set of tools to intervene early and quickly enough in an institution considered to be failing so as to ensure the continuity of the institution's essential financial and economic functions while reducing the impact of the failure of an institution on the economy and the financial system (including the exposure of taxpayers to the consequences of the failure). Under the SRM Regulation, a centralised resolution authority is established and entrusted to the SRB and national resolution authorities.

The powers granted to the resolution authority under the BRRD and the SRM Regulations include write-down/conversion powers to ensure that capital instruments and eligible liabilities absorb the Group's losses and recapitalise it in accordance with an established order of priority (the "Bail-in Tool"). Subject to certain exceptions, losses are borne first by the shareholders and then by the holders of additional Tier 1 and Tier 2 capital instruments, then by the non-preferred senior debt holders and finally by the senior preferred debt holders, all in the order of their claims in a normal insolvency proceeding. The conditions for resolution provided by the French Monetary and Financial Code implementing the BRRD are deemed to be met if: (i) the resolution authority or the competent supervisory authority determines that the institution is failing or likely to fail; (ii) there is no reasonable perspective that any measure other than a resolution measure could prevent the failure within a reasonable timeframe; and (iii) a resolution measure is necessary to achieve the resolutions' objectives (in particular, ensuring the continuity of critical functions, avoiding a significant negative effect on the financial system, protecting public funds by minimising the recourse to extraordinary public financial support, and protecting customers' funds and assets) and the winding up of the institution under normal insolvency proceedings would not meet these objectives to the same extent.

The resolution authority could also, independently of a resolution measure or in combination with a resolution measure, proceed with the write-down or conversion of all or part of the Group's capital instruments (including subordinated debt instruments) into equity if it determines that the Group will no longer be viable unless it exercises this write-down or conversion power or if the Group requires extraordinary public financial support (except where the extraordinary public financial support is provided in the form defined in Article L. 613-48 III, paragraph 3 of the French Monetary and Financial Code).

The Bail-in Tool could result in the write-down or conversion of capital instruments in whole or in part into ordinary shares or other ownership instruments.

In addition to the Bail-in Tool, the BRRD provides the resolution authority with broader powers to implement other resolution measures with respect to institutions that meet the resolution requirements, which may include (without limitation) the sale of the institution's business segments, the establishment of a bridge institution, the split of assets, the replacement or substitution of the institution as debtor of debt securities, changing the terms of the debt securities (including changing the maturity and/or amount of interest payable and/or the imposition of a temporary suspension of payments), the dismissal of management, the appointment of a provisional administrator and the suspension of the listing and admission to trading of financial instruments.

Before taking any resolution action, including the implementation of the Bail-in Tool, or exercising the power to write down or convert relevant capital instruments, the resolution authority must ensure that a fair, prudent and realistic valuation of the institution's assets and liabilities is made by a third party independent of any public authority.

The application of any measure under the French implementing provisions of the BRRD or any suggestion of such application to the Group could have a material adverse effect on the Group's ability to meet its obligations under its financial instrument and, as a result, holders of these securities could lose their entire investment.

In addition, if the Group's financial condition deteriorates, the existence of the Bail-in Tool or the exercise of write-down or conversion powers or any other resolution tool by the resolution authority (independently of or in combination with a resolution) if it determines that Societe Generale or the Group will no longer be viable could result in a more rapid decline in the value of the Group's financial instruments than in the absence of such powers.

4.1.2 CREDIT AND COUNTERPARTY CREDIT RISKS

Weighted assets (RWA) in relation to credit and counterparty risks amounted to EUR 300.7 billion at 31 December 2022.

4.1.2.1 The Group is exposed to credit, counterparty and concentration risks, which may have a material adverse effect on the Group's business, results of operations and financial position.

Due to its Financing and Market activities, the Group is exposed to credit and counterparty risk. The Group may therefore incur losses in the event of default by one or more counterparties, particularly if the Group encounters legal or other difficulties in enforcing the collateral allocated to its exposures or if the value of this collateral is not sufficient to fully recover the exposure in the event of default. Despite the Group's efforts to limit the concentration effects of its credit portfolio exposure, it is possible that counterparty defaults could be amplified within the same economic sector or region of the world due to the interdependence of these counterparties.

Consequently, the default of one or more significant counterparties of the Group could have a material adverse effect on the Group's cost of risk, results of operations and financial position.

At 31 December 2022, the Group's exposure at default (EAD, excluding counterparty risk) was EUR 956 billion, with the following breakdown by type of counterparty: 29% on sovereigns, 31% on corporates, 23% on retail customers and 5% on credit institutions and similar. Risk-weighted assets (RWA) for credit risk totalled EUR 276 billion.

Regarding counterparty risks resulting from market transactions (excluding CVA), at the end of December 2022, the exposure value (EAD) was EUR 163 billion, mainly to corporates (36%) and credit institutions and similar entities (31%) and to a lesser extent to sovereign entities (29%). Risk-weighted assets (RWA) for counterparty risk amounted to EUR 21 billion.

At 31 December 2022, the main sectors to which the Group is exposed in its corporate portfolio included financial activities (accounting for 6.9% of total Group exposure), real estate (3.5%), social services (2.8%), manufacturing (2.2%), telecommunications, media and technology (2.0%), the agriculture sector and agri-food industries (1.8%) and the oil and gas sector (1.8%).

In terms of geographical concentration, the five main countries to which the Group was exposed at 31 December 2022 were France (51% of the Group's total EAD, mainly related to Sovereigns and Retail customers), the US (15% of EAD, mainly related to corporates and sovereigns), the UK (4% of EAD, mainly related to corporates and credit institutions), Germany (4% of total Group EAD, mainly related to credit institutions and corporates) and the Czech Republic (3% of the Group's total EAD, mainly related to retail clients and corporates). Furthermore, the financial situation of certain counterparties could be affected by the geopolitical tensions mentioned in section 4.1.1.1 *"The global economic and financial context, geopolitical tensions, as well as the market environment in which the Group operates, may adversely affect its activities, financial position and results of operations"*.

For more detail on credit and counterparty risk, see sections 4.5.5 *"Quantitative information"* and 4.6.3 *"Counterparty credit risk measures"* of the 2023 Universal Registration Document.

4.1.2.2 The financial soundness and conduct of other financial institutions and market participants could have an adverse effect on the Group's business.

Financial institutions and other market players (commercial or investment banks, credit insurers, mutual funds, alternative funds, institutional clients, clearing houses, investment service providers, etc.) are important counterparties for the Group in capital or inter-bank markets. Financial services institutions and financial players are closely interrelated as a result of trading, clearing and funding relationships. In addition, there is a growing involvement in the financial markets of players with little or no regulation (hedge funds, for example). As a result, defaults by one or several actors in the sector or a crisis of confidence affecting one or more actors could result in market-wide liquidity scarcity or chain defaults, which would have an adverse effect on the Group's activity but which is subject to a specific framework. The situation in Ukraine and the consequences of, among other things, international sanctions and the evolution of the financial markets, in particular the rise in interest rates, could also weaken or even cause the default of a certain number of financial actors. In addition, certain financial actors could experience operational or legal difficulties in the unwinding or settlement of certain financial transactions.

The Group is exposed to clearing institutions and their members because of the increase in transactions traded through these institutions, induced in part by regulatory changes that require mandatory clearing for over-the-counter derivative instruments standardised by these clearing counterparties. The Group's exposure to clearing houses amounted to EUR 32.7 billion of EAD on 31 December 2022. The default of a clearing institution or one of its members could generate losses for the Group and have an adverse effect on the business and results of the Group. These risks are also subject to specific monitoring and supervision.

The Group is also exposed on assets held as collateral for credit or derivatives instruments, with the risk that, in the event of failure of the counterparty, some of these assets may not be sold or that their disposal price may not cover the entire exposure in credit and counterparty risks. These assets are subject to periodic monitoring and a specific management framework.

4.1.2.3 The Group's results of operations and financial position could be adversely affected by a late or insufficient provisioning of credit exposures.

The Group regularly records provisions for doubtful loans in connection with its lending activities in order to anticipate the occurrence of losses. The amount of provisions is based on the most accurate assessment at the time of the recoverability of the debts in question. This assessment, based notably on multi-scenario approaches, relies on an analysis of the current and prospective situation of the borrower as well as an analysis of the value and recovery prospects of the debt, taking into account any security interests. In some cases (loans to individual customers), the provisioning method may call for the use of statistical models based on the analysis of historical losses and recovery data. Since 1 January 2018, the Group has also been recording provisions on performing loans under the IFRS 9 accounting standard. This assessment is based on statistical models for assessing probabilities of default and potential losses in the event of default, which take into account a prospective analysis based on regularly updated macroeconomic scenarios.

IFRS 9 accounting standard principles and provisioning models could be pro-cyclical in the event of a sharp and sudden deterioration in the environment. A deterioration of the geopolitical and macroeconomic environment could lead to a significant and/or not-fully-anticipated variation in the cost of risk and therefore in the Group's results of operations.

At 31 December 2022, the stock of provisions relating to outstanding amounts (on- and off-balance sheet) amounted to EUR 3.8 billion on performing assets and EUR 8.2 billion on assets in default. Outstanding loans in default at amortised cost (stage 3 under IFRS 9) represented EUR 16.3 billion, including 49% in France, 24% in Africa and Middle East and 10% in Western Europe (excluding France). The gross ratio of doubtful loans on the balance sheet was 2.8% and the gross coverage ratio of these loans was approximately 48%. The cost of risk stood at 28 basis points in 2022, against a cost of risk of 13 basis points in 2021.

4.1.3 MARKET AND STRUCTURAL RISKS

Market risk corresponds to the risk of impairment of financial instruments resulting from changes in market parameters, the volatility of these parameters and the correlations between these parameters. The concerned parameters include exchange rates, interest rates, as well as the prices of securities (shares, bonds) and commodities, derivatives and any other assets.

4.1.3.1 Sharp changes in interest rates may adversely affect retail banking activities in France in the short term.

The Group generates a significant part of its income through net interest margins and, as such, remains exposed to interest-rate fluctuations in both absolute terms and with respect to the shape of the yield curve, particularly in its Retail Banking activities in France. The Group's results are influenced by changes in interest rates in Europe and in the other markets where it operates.

There is a risk of the Group's interest-rate margin narrowing when interest rates decline, due not only to lower remuneration from deposit replacement but also to a higher risk of mortgage loans being renegotiated in the French market.

A series of very rapid rate hikes also presents a risk to the Group's revenues. This scenario can materialise when central banks put a stop to accommodating monetary policies in response to economic recovery or spiking inflation. A sharp increase in key rates combined with a context of high inflation may have negative effects in the short- and medium-term, particularly in France, due to the upward interest-rate adjustment to the remuneration on certain savings products (the *Livret A* savings account, in particular) and the inability to fully pass on the increase to client rates for assets such as mortgage and consumer loans (in addition to the specific problems associated with the usury rate in the French market). Furthermore, changes in client behaviour in response to rising rates - notably for savings products - can call for adjustments to the interest-rate hedges in place which could dent Group revenues. Last, a potential decrease in value of assets measured at fair value could also negatively impact revenues.

For more information on structural interest-rate risks, see Chapter 4.8 "Structural risks, interest rate and exchange rate" and Note 8.1 "Segmented reporting" in Chapter 6 of the 2023 Universal Registration Document.

4.1.3.2 Changes and volatility in the financial markets may have a material adverse effect on the Group's business and the results of market activities.

In the course of its activities, the Group takes trading positions in the debt, currency, commodities and stock markets, as well as in unlisted shares, real estate assets and other types of assets including derivatives. The Group is thus exposed to "market risk". Volatility in the financial markets can have a material adverse effect on the Group's market activities. In particular:

- significant volatility over a long period of time could lead to corrections on risky financial assets (and especially on the riskiest assets) and generate losses for the Group;
- a sudden change in the levels of volatility and its structure, or alternative short-term sharp declines and fast rebounds in markets, could make it difficult or more costly to hedge certain structured products and thus increase the risk of loss for the Group.

Severe market disruptions and high market volatility have occurred in recent years and may occur again in the future, which could result in significant losses for the Group's markets activities. Such losses may extend to a broad range of trading and hedging products, notably on derivative instruments, both vanilla and structured.

In the event that a much lower-volatility environment emerges, reflecting a generally optimistic sentiment in the markets and/or the presence of systematic volatility sellers, increased risks of correction may also develop, particularly if the main market participants have similar positions (market positions) on certain products. Such corrections could result in significant losses for the Group's market activities. The volatility of the financial markets makes it difficult to predict trends and implement effective trading strategies; it also increases risk of losses from net long positions when prices decline and, conversely, from net short positions when prices rise. The realisation of any such losses could have a material adverse effect on the Group's results of operations and financial position.

Similarly, the sudden decrease in, or even the cancellation of, dividends, as experienced during the Covid-19 pandemic, and changes in the correlations of different assets of the same class, could affect the Group's performance, with many activities being sensitive to these risks.

A prolonged slowdown in financial markets or reduced liquidity in financial markets could make asset disposals or position manoeuvrability more difficult, leading to significant losses. In many of the Group's activity segments, a prolonged decline in financial markets, particularly asset prices, could reduce the level of activity in these markets or their liquidity. These variations could lead to significant losses if the Group were unable to quickly unwind the positions concerned, adjust the coverage of its positions, or if the assets held in collateral could not be divested, or if their selling prices did not cover the Group's entire exposure on defaulting loans or derivatives.

The assessment and management of the Group's market risks are based on a set of risk indicators that make it possible to evaluate the potential losses incurred at various time horizons and given probability levels, by defining various scenarios for changes in market parameters impacting the Group's positions. These scenarios are based on historical observations or are hypothetically defined. However, these risk management approaches are based on a set of assumptions and reasoning that could turn out to be inadequate in certain configurations or in the case of unexpected events, resulting in a potential underestimation of risks and a significant negative effect on the results of the Group's market activities.

Furthermore, in the event of a deterioration of the market situation, the Group could experience a decline in the volume of transactions carried out on behalf of its customers, leading to a decrease in the revenues generated from this activity and in particular in commissions received.

In 2022, the reduction in accommodative monetary policies led to significant corrections in certain markets or asset classes. The initiation of a monetary tightening cycle by a few central banks, in order to alleviate inflationary pressures, led to tensions and volatility in rates in the first quarter of 2022, reflected notably by an increase and a flattening of the main curves.

Hope for normalisation in monetary policies in 2023 in the coming months has led to an improvement in overall sentiment of the financial markets and the appreciation of risky assets. However, the deterioration of certain macroeconomic and financial indicators suggests a possible recession in Europe and the US in the next year. This could have a significant negative impact on the Group's market activities and results. Finally, financial markets outlook remains uncertain due in part to inflationary pressures and to a turbulent geopolitical context.

For information purposes, Global Markets & Investor Services activities represented EUR 6.7 billion of net banking income in 2022, or 24% of the Group's total revenues. At 31 December 2022, risk-weighted assets (RWA) in relation to market risk represented EUR 13.7 billion (4% of the Group's total RWA).

4.1.3.3 Fluctuations in exchange rates could adversely affect the Group's results.

As a result of the Group's policy of desensitising the CET1 ratio to changes in the exchange rate of currencies against the euro, the Group's consolidated equity is favorably exposed in the event of currency appreciation against the euro.

Thus, in the event of an appreciation of the euro against foreign currencies, the Group's consolidated equity could be negatively impacted.

Because the Group publishes its consolidated financial statements in euros, which is the currency of most of its liabilities, it is also subject to translation risk for items recorded in other currencies, in the preparation of its consolidated financial statements. Exchange rate fluctuations of these currencies against the euro may adversely affect the Group's consolidated results, financial position and cash flows. Exchange rate fluctuations may also negatively affect the value (denominated in euros) of the Group's investments in its subsidiaries outside the eurozone.

For more information of structural exchange rate risk, see Chapter 4.8 *"Structural risks, interest rate and exchange rate"* of the 2023 Universal Registration Document.

4.1.4 LIQUIDITY AND FUNDING RISKS

4.1.4.1 A downgrade in the Group's external rating or in the sovereign rating of the French state could have an adverse effect on the Group's cost of financing and its access to liquidity.

For the proper conduct of its activities, the Group depends on access to financing and other sources of liquidity. In the event of difficulties in accessing the secured or unsecured debt markets on terms it considers acceptable, due to market conditions or factors specific to the Group, or if it experiences unforeseen outflows of cash or collateral, including material decreases in customer deposits, its liquidity could be impaired. In addition, if the Group is unable to maintain a satisfactory level of customer deposits collection, it may be forced to turn to more expensive funding sources, which would reduce the Group's net interest margin and results.

The Group is exposed to the risk of an increase in credit spreads. The Group's medium and long-term financing cost is directly linked to the level of credit spreads which can fluctuate depending on general market conditions. These spreads can also be affected by an adverse change by the rating agencies in France's sovereign debt rating or countries rating where the Group operates as well as the Group's external ratings as described below.

The Group is currently monitored by four financial rating agencies: Fitch Ratings, Moody's, R&I and Standard & Poor's. The downgrading of the Group's credit ratings, by these or other agencies, could have a significant impact on the Group's access to funding, increase its cost of financing or reduce its ability to carry out certain types of transactions or activities with customers. This could also require the Group to provide additional collateral to certain counterparties, which could have an adverse effect on its business, financial position and results of operations.

Material events such as severe damage to the Group's reputation, the deterioration of the economic environment following the health crisis, France's sovereign downgrading or countries downgrading where the Group operates, or more recently as a result of the crisis in Ukraine and its impact on the Group, particularly in terms of profitability and cost of risk, could increase the risk of external rating downgrades. The Group's ratings could be placed under negative watch or be subject to a downgrade. In particular, France's sovereign ratings could also be downgraded due to an increase in its debt and deficits (further increased by the Covid-19 pandemic and the response measures taken by the French government) and the inability to pass structural reforms. These elements could have a negative impact on the Group's financing costs and its access to liquidity. The Group's ratings by Fitch Ratings, Moody's, R&I and Standard & Poor's are available on the Group's website (*https://investors.societegenerale.com/en/financial-and-non-financial-information/ratings/credit-ratings*)

Access to financing and liquidity constraints could have a material adverse effect on the Group's business, financial position, results of operations and ability to meet its obligations to its counterparties.

In 2022, the Group raised a total of EUR 46.7 billion of long-term funding (of which EUR 44.0 billion for the parent company and EUR 2.7 billion for its subsidiaries) comprising, at the parent company level, senior structured issues (EUR 23.7 billion), subordinated issues (EUR 2.5 billion), senior vanilla non-preferred issues (EUR 6.0 billion), unsecured senior vanilla preferred issues (EUR 6.4 billion) and secured issues (EUR 5.4 billion).

For 2023, the Group has planned a funding programme of approximately EUR 24 billion in vanilla long-term debt, in senior preferred and secured debt as well as in senior non-preferred debt and subordinated debt.

4.1.4.2 The Group's access to financing and the cost of this financing could be negatively affected in the event of a resurgence of financial crises or deteriorating economic conditions.

In past crises (such as the 2008 financial crisis, the eurozone sovereign debt crisis, the tensions on the financial markets linked to the Covid-19 pandemic before the intervention of the central banks, or more recently the tensions linked to the crisis in Ukraine), access to financing from European banks was intermittently restricted or subject to less favorable conditions.

If unfavorable debt market conditions were to reappear following a new systemic or Group-specific crisis, the effect on the liquidity of the European financial sector in general and on the Group in particular could be very significantly unfavorable and could have an adverse impact on the Group's operating results as well as its financial position.

For several years, central banks have taken measures to facilitate financial institutions' access to liquidity, in particular by lowering interest rates to historical lows and by setting up TLTRO (Targeted Longer-Term Refinancing Operations) type facilities and by implementing asset purchase policies to keep long-term interest rates at very low levels. In a context of higher inflation, central banks (notably the ECB and the US Federal Reserve) have begun to phase out these accommodating policies. In this context, the Group could face an unfavorable evolution of its financing cost and access to liquidity.

In addition, if the Group were unable to maintain a satisfactory level of deposits from its customers, it could be forced to resort to more expensive financing, which would reduce its net interest margin as well as its results.

The Group's regulatory short-term liquidity coverage ratio (LCR) stood at 145% at 31 December 2022 and liquidity reserves amounted to EUR 279 billion at 31 December 2022.

4.1.5 EXTRA-FINANCIAL RISKS (INCLUDING OPERATIONAL RISKS) AND MODEL RISKS

At 31 December 2022, risk-weighted assets in relation to operational risk amounted to EUR 46 billion, or 13% of the Group's total RWA. These risk-weighted assets relate mainly to Global Markets & Investor Services (63% of total operational risk).

Between 2018 and 2022, the Group's operational risks were primarily concentrated in five risk categories, representing 94% of the Group's total operating losses observed over the period: fraud (mainly external frauds) and other criminal activities (33%), execution errors (24%), disputes with authorities (15%), errors in pricing or risk assessment, including model risk (13%) and commercial disputes (9%). The Group's other categories of operational risk (unauthorised activities in the markets, loss of operating resources and failure of information systems) remain minor, representing on average 6% of the Group's losses between 2018 and 2022.

See Chapter 4.10.3 "Operational risk measurement" of the 2023 Universal Registration Document for more information on the allocation of operating losses.

4.1.5.1 A breach of information systems, notably in the event of cyberattack, could have an adverse effect on the Group's business, results in losses and damage the Group's reputation.

The Group relies heavily on communication and information systems to conduct its business and this is reinforced by the widespread use of remote banking and the digitalisation of processes. Any breach of its systems or the systems of its external partners could materially disrupt the Group's business. Such incidents could result in significant costs related to the recovery and verification of information, loss of revenues, customer attrition, disputes with counterparties or customers, difficulties in managing market operations and short-term refinancing operations, and ultimately damage the Group's reputation. Difficulties experienced by the Group's counterparties could also indirectly generate credit and/or reputational risks for the Group. The situation stemming from the conflict in Ukraine mentioned in section 4.1.1.1 "The global economic and financial context, geopolitical tensions, as well as the market environment in which the Group operates, may adversely affect its activities, financial position and results of operations" increases the risk of cyberattacks for the Group and its external partners.

Each year, the Group is subject to several cyberattacks on its systems or those of its clients, partners and suppliers. The Group could be subject to targeted and sophisticated attacks on its computer network, resulting in embezzlement, loss, theft or disclosure of confidential data or customer data (which could constitute violations of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data ("GDPR"). Such actions could result in operational losses and have an adverse effect on the Group's business, results and reputation with its customers.

4.1.5.2 The Group is exposed to legal risks that could have a material adverse effect on its financial position or results of operations.

In the case of non-compliance with applicable laws and regulations, the Group and certain of its former and current representatives may be involved in various types of litigation, including civil, administrative, tax, criminal and arbitration proceedings. The large majority of such proceedings arise from transactions or events that occur in the Group's ordinary course of business. There has been an increase in client, depositor, creditor and investor litigation and regulatory proceedings against intermediaries such as banks and investment advisors in recent years, in part due to the challenging market environment. This has increased the risk for the Group of losses or reputational harm arising from litigation and other proceedings. Such proceedings or regulatory enforcement actions could also lead to civil, administrative, tax or criminal penalties that could adversely affect the Group's business, financial position and results of operations. The situation generated by the conflict in Ukraine mentioned in 4.1.1.1 "*The global economic and financial context, geopolitical tensions, as well as the market environment in which the Group operates, may adversely affect its activities, financial position and results of operations*" could increase the Group's legal risk.

In preparing its financial statements, the Group makes estimates regarding the financial outcome of civil, administrative, tax, criminal and arbitration proceedings in which it is involved, and records a provision when losses with respect to such matters are probable and can be reasonably estimated. It is inherently difficult to predict the outcome of litigation and proceedings involving the Group's businesses, particularly those cases in which the matters are brought on behalf of various classes of claimants, cases where claims for damages are of unspecified or indeterminate amounts, or cases involving unprecedented legal claims. Should such estimates prove inaccurate or should the provisions set aside by the Group to cover such risks prove inadequate, the Group's financial position or results of operations could be adversely affected.

The provision recorded in the Group's financial statements for public rights disputes amounted to EUR 396 million at 31 December 2022.

For a description of the most significant ongoing proceedings, see section 4.11 *"Compliance "*, Note 8.3.2 *"Other provisions for risks and expenses"* and Note 9 *"Information on risks and litigation"* of Chapter 6 of the 2023 Universal Registration Document.

4.1.5.3 Operational failure, termination or capacity constraints affecting institutions the Group does business with, or failure of information technology systems could have an adverse effect on the Group's business and result in losses and damages to its the reputation.

Any dysfunction, failure or interruption of service of the Group's communication and information systems or the systems of its external partners, even brief and temporary, could result in significant disruptions to the Group's business. Such incidents could result in significant costs related to information retrieval and verification, loss of revenue, loss of customers, litigation with counterparties or customers, difficulties in managing market operations and short-term refinancing, and ultimately damage to the Group's reputation.

The Group is exposed to the risk of operational failure or capacity constraints in its own systems and in the systems of third parties, including those of financial intermediaries that it uses to facilitate cash settlement or securities transactions (such as clearing agents and houses and stock exchanges), as well as those of clients and other market participants.

The interconnections between various financial institutions, clearing houses, stock exchanges and service providers, including external cloud services, increase the risk that the operational failure of any one of them could lead to an operational failure of the entire sector, which could have an adverse impact on the Group's ability to conduct its business and could therefore result in losses. This risk is likely to be increased by industry concentration, whether among market participants or financial intermediaries, as complex and disparate systems need to be integrated, often on an accelerated basis.

The Group is also subject to various regulatory reforms and major internal strategic projects that may lead to operational disruptions and have an impact on the Group's operations, the accounting of transactions and their tax or prudential treatment, and on the Group's results in the event of poor project management and understanding of operational risks. Examples include the merger of the Societe Generale and Crédit du Nord retail networks, with the transfer of Crédit du Nord's information system to the Societe Generale information system, and important steps towards the transfer have already been taken. In addition, the ALD and LeasePlan merger is structured with large project teams to ensure proper execution and impacts for the Group.

4.1.5.4 The Group is exposed to fraud risk, which could result in losses and damage its reputation.

Fraud risk is defined as the intentional non-compliance with existing laws, regulations or procedures, which in most cases results in harm to the bank or its customers and provides the fraudster or his or her relatives with a direct or indirect material or moral benefit.

The risk of fraud increases intrinsically in a crisis context (financial pressure among clients, third parties or our employees) and in a remote working environment that may limit the capacity for monitoring and exchanges by or with the manager or other employees contributing to the prevention or detection of fraud risk. This risk mainly involves external fraud related to the Bank's credit activities and to the means of payment (electronic banking, transfers, and checks) made available to customers. Fraud schemes are changing rapidly in terms of volume and approach, in line with the security measures and counter-measures developed in the market and within the Group. Internal fraud is carried out through the misappropriation of funds and the granting of undue facilities and can be carried out with or without external collusion. Finally, unauthorised rogue trading, with or without circumvention of controls, could impact results and have a very significant negative impact on the Group's reputation.

Between 2018 and 2022, the risk of fraud represented 33% of the Group's total operating losses.

4.1.5.5 Reputational damage could harm the Group's competitive position, its activity and financial condition.

An organisation benefits from a good reputation when its activities and services meet or exceed the expectations of its stakeholders, both external (customers, investors, shareholders, regulators, supervisors, suppliers, opinion leaders such as NGOs, etc.) and internal (employees).

The Group's reputation for financial strength and integrity is critical to its ability to foster loyalty and develop its relationships with clients and other counterparties in a highly competitive environment. Any reputational damage could result in loss of activity with its customers or a loss of confidence on the part of its investors, which could affect the Group's competitive position, its business and its financial condition.

Financing extended by the bank that does not comply with regulations or its commitments, notably in terms of environmental and social responsibility, could affect the Group's reputation. Methods of distribution of products and services that do not provide sufficient information to customers, a lack of transparency in its communication (particularly financial communication) or internal management rules (including human resources management or relations with suppliers and service providers) that do not comply with regulatory obligations or the bank's commitments could affect the Group's reputation. In addition, the situation in Ukraine and the international sanctions put in place create an environment that is likely to increase the Group's reputation risk.

A corporate social responsibility strategy (in particular with regard to environmental issues) deemed insufficiently ambitious in relation to the expectations of external stakeholders or difficulties in implementing this strategy could also impact the Group's reputation.

As a result, negative comments regarding the Group, whether or not legitimate, and concerning events that may or may not be attributable to the Group, could deteriorate the Group's reputation and affect its competitive position.

The Group's reputation could also be adversely affected by a weakness in its internal control measures aimed at monitoring and preventing operational, compliance, credit and market risks, particularly with respect to monitoring inappropriate conduct of its employees (such as corruption, fraud, market abuse, tax evasion and money laundering). This risk may arise from the conduct itself as well as from administrative or criminal sanctions penalising an insufficiently effective control environment, such as the sanctions issued by the US and French authorities in 2018 relating to the Group's failure to comply with economic embargo measures.

As a result, a perceived lack of commitment to the Group's Code of Conduct, which aims to anchor the Group's values in terms of ethics and responsibility, could be detrimental to the Group's good reputation.

These various issues could also have a non-negligible impact on the Group's ability to attract and recruit younger talent or to retain talent within the Group.

The consequences of these events, which could potentially result in legal proceedings, may vary according to the extent of media coverage and the overall context and remain difficult to estimate.

For more information about reputation risk please see section 4.11 *"Compliance risk"* of the 2023 Universal Registration Document.

4.1.5.6 The Group's inability to attract and retain qualified employees may adversely affect its performance.

At 31 December 2022, the Group employed more than 117,000 people in 66 countries. Human resources are key assets of the Group, its business model and value proposition.

The emergence of new players and new technologies in the banking sector, as well as the consequences of the health crisis, have accelerated the transformation of the Bank, directly impacting the way the Company operates and the way employees work. Inadequate career and skills management (integration, career prospects, training, HR support, compensation levels in line with market practice, etc.), transformation projects, as well as a lack of attractiveness and poor working conditions could lead to a loss of resources, know-how and commitment. This would have a negative impact on individual and collective performance and the Group's competitiveness. The inability of Societe Generale to attract and retain employees, a high rate of turnover or the loss of strategic employees could adversely affect the performance of the Group, result in a loss of business, a deterioration in the quality of service (at the expense of client satisfaction) and a deterioration in the quality of working life (to the detriment of the employee experience).

For more information, see section 5.1.1 "*Being a responsible employer*" of the 2023 Universal Registration Document.

4.1.5.7 The models, in particular the Group's internal models, used in strategic decision-making and in risk management systems could fail, face delays in deployment or prove to be inadequate and result in financial losses for the Group.

Internal models used within the Group could prove to be deficient in terms of their conception, calibration, use or monitoring of performance over time in relation to operational risk and therefore could produce erroneous results, notably with financial consequences. The faulty use of so-called artificial intelligence techniques in the conception of these models could also generate erroneous results.

In particular:

- the valuation of certain financial instruments that are not traded on regulated markets or other trading platforms, such as OTC derivative contracts between banks, uses internal models that incorporate unobservable parameters. The unobservable nature of these parameters results in an additional degree of uncertainty as to the adequacy of the valuation of the positions. In the event that the relevant internal models prove unsuitable for changing market conditions, some of the instruments held by the Group could be misvalued and could generate losses for the Group. For illustrative purposes, financial assets and liabilities measured at fair value on the balance sheet categorised within level 3 (for which the valuation is not based on observed data) represented EUR 14.7 billion and EUR 43.4 billion, respectively, as of 31 December 2022 (see Note 3.4.1 and Note 3.4.2 of Chapter 6 of the consolidated financial statements included in the 2023 Universal Registration Document on financial assets and liabilities measured at fair value);
- the assessment of client solvency and the Bank's exposure to credit risk and counterparty risk is generally based on historical assumptions and observations that may prove to be inappropriate in light of new economic conditions. It is based on economic scenarios and projections that may not adequately anticipate unfavorable economic conditions or the occurrence of unprecedented events. This miscalculation could, among other things, result in an under-valuation and an under-provisioning of risks and an incorrect assessment of capital requirements;
- hedging strategies used in market activities rely on models that include assumptions about the changes of market parameters and their correlation, partly inferred from historical data. These models could be inappropriate in certain market environments (in the event of a large-scale armed conflict, strong movements in volatility resulting, for example, from a pandemic, or tensions between the United States and China, in the Middle East or in Africa), leading to an ineffective hedging strategy, thus causing unanticipated losses that could have a material adverse effect on the Group's results and financial position;
- hedging strategies to manage the interest-rate and liquidity risks of retail banking activities, particularly those in France, use models that include behavioural assumptions. These models are partly based on historical observations the purpose of which is to predict client behaviour in the most likely scenarios. That said, they may be unsuitable for certain specific or new market configurations - for example, sharp increases and decreases - making the resulting hedging strategies inappropriate, thereby potentially harming bank revenues.

In addition, the Group has introduced changes to its internal credit risk model framework (dubbed the "Haussmann project"). These changes could have a significant impact on the calculation of its RWA credit and counterparty risk in the event of timetable delays when submitting its models to the supervisor or in the event of the late validation by the supervisor.

4.1.5.8 The Group may incur losses as a result of unforeseen or catastrophic events, including health crises, large-scale armed conflicts, terrorist attacks or natural disasters.

The Group remains dependent on its environment. The occurrence of a new epidemic or pandemic crisis (such as the Covid-19 pandemic) or a health crisis related to the pollution of the natural environment could have a significant impact on the Group's activities. Also, large-scale armed conflicts, terrorist attacks, natural disasters (including earthquakes, such as in Romania, and floods, such as the exceptional flooding of the Seine in Paris or the Chennai in India), extreme weather conditions (such as heatwaves) or major social unrest (such as the *"Gilets Jaunes"* movement in France) could affect the Group's activities.

Such events could create economic and financial disruptions or lead to operational difficulties (including travel limitations or relocation of affected employees) for the Group.

These events could impair the Group's ability to manage its businesses and also expose its insurance activities to significant losses and increased costs (such as higher re-insurance premiums). The Group could incur losses if these risks materialise.

4.1.6 RISKS RELATED TO INSURANCE ACTIVITIES

4.1.6.1 A deterioration in market conditions, and in particular a significant increase or decrease in interest rates, could have a material adverse effect on the life insurance activities of the Group's Insurance business.

In 2022, the Group's insurance activities represented net banking income of EUR 1 billion, or 4% of the Group's consolidated net banking income. The Group's Insurance Division is mainly focused on life insurance. At 31 December 2022, life insurance contracts registered outstandings of EUR 132 billion, divided between euro-denominated contracts (64%) and unit-linked contracts (36%).

The Group's Insurance business is highly exposed to interest-rate risk due to the high proportion of bonds in the euro-denominated funds in its life insurance contracts. The level of and changes in interest rates may, in certain configurations, have a material adverse effect on the results and financial position of this business line.

With its impact on the yield of euro-denominated contracts, a prolonged outlook of low interest rates reduces the attractiveness of these products for investors, which can negatively affect fundraising and income from this segment of the life insurance business.

A sharp rise in interest rates could also degrade the competitiveness of the life insurance offerings in euros (compared with bank savings products, for example) and trigger significant repurchases and arbitrage operations by customers, in an unfavourable context of unrealised losses on bond holdings. This configuration could affect the revenues and profitability of the life insurance activity.

More generally, pronounced spread widening and a decline in equity markets could also have a significant negative effect on the results of the Group's life insurance business.

In the event of a deterioration in market parameters, the Group could be required to strengthen the capital of its insurance subsidiaries to enable them to continue meeting their regulatory requirements in this domain.

4.2 RISK MANAGEMENT ORGANISATION

4.2.1 RISK APPETITE

Risk appetite is defined as the level of risk that the Group is prepared to accept to achieve its strategic and financial goals.

Principles governing risk appetite

The Group's ambition is to push ahead with sustainable development based on a diversified and balanced banking model with a strong European anchor and a targeted global presence in selected areas of strong business expertise. The Group also wishes to maintain long-term relationships with its clients built on the mutual confidence deserved and to meet the expectations of all of its stakeholders by providing them with responsible and innovative financial solutions.

This is reflected in:

- an organisation with 14[(1)] Business Units (BUs) offering various products and services to the Group's clients in different geographic locations;
- balanced selective capital allocation between activities:
  - a preponderance of retail banking activities in France and abroad, which currently represent more than 50% of risk weighted assets ("RWA") of the Group,
  - limitation of Business Unit Global Markets' share in the RWA of the Group. In accordance with its client-focused development strategy, the Group ceased its trading activities for its own account[(2)] in 2019, and finalised its project to simplify the products processed in 2021,
  - non-bank services activities, in particular Insurance and operating leasing activities are conducted in line with the business strategy; they demonstrate a disciplined risk profile and thus generate profitability compliant with the Group's expectations;
- a geographically balanced model:
  - in Retail Banking, the Group focuses on international development where it benefits from a historical presence, extensive market knowledge and top-tier positions, in Retail Banking activities,
  - as regards Global Banking and Investor Solutions, apart from historical establishments, the Group targets activities for which it can leverage international expertise;
- a targeted growth policy, favoring existing areas of expertise, the sound quality business fund and the search for synergies in the diversified banking model;
- a positive and sustainable contribution to the transformation of our economies, in particular with regard to the technological revolution, and economic, social and environmental transitions; CSR concerns are therefore at the heart of its strategy and the Group's relationships with stakeholders (internal and external);
- a strong vigilance as regards its reputation, deemed by the Group to be a high-value asset which must be protected.

A robust financial strength profile

The Group seeks to achieve sustainable profitability, relying on a robust financial profile consistent with its diversified banking model, by:

- aiming for profitable and resilient business development;
- maintaining a rating allowing access to financial resources at a cost consistent with the development of the Group's businesses and its competitive positioning;
- calibrating its capital and hybrid debt monitorings to ensure:
  - meeting the minimum regulatory requirements on regulatory capital ratios,
  - compliance with the financial conglomerate ratio which considers the combined solvency of the Group's banking and insurance activities,
  - one-year coverage of the "internal capital requirement" using available CET1 capital,
  - a sufficient level of creditor protection consistent with a debt issuance program that is particularly hybrid consistent with the Group's objectives in terms of rating and regulatory ratios such as Tier 1, TLAC ("Total Loss Absorbing Capacity"), MREL ("Minimum Required Eligible Liabilities"), and the leverage ratio;
- ensuring resilience of its liabilities, which are calibrated by taking into account a survival horizon in a liquidity stress ratio, compliance with LCR (Liquidity Coverage Ratio) and NSFR (Net Stable Funding Ratio) regulatory ratios and the level of dependence on short-term fundings and the foreign exchange needs of the Group's businesses, particularly in dollars;
- controlling the leverage ratio.

Credit risk (including concentration effects)

Credit risk appetite is managed through a system of credit policies, risk limits and pricing policies.

When it takes on credit risk, the Group focuses on medium- and long-term client relationships, targeting both clients with which the Bank has an established relationship of trust and prospects representing profitable business development potential over the mid-term.

Acceptance of any credit commitment is based on in-depth client knowledge and a thorough understanding of the purpose of the transaction.

In particular, concerning the underwriting risk, the Group, mainly through GLBA, makes a steadfast commitment to transactions at a guaranteed price as debt financing arranger, prior to syndicating them to other banking syndicates and institutional investors. If market conditions deteriorate or markets close while the placement is under way, these transactions may create a major over-concentration risk (or losses, if the transaction placement requires selling below the initial price).

(1) Fourteen BUs, after CDN and BDDF merged on 1 January 2023.

(2) In accordance with French banking law, the few residual trading activities of the Group unrelated to clients were isolated in a dedicated subsidiary called Descartes Trading.

The Group limits the cumulative amount of approved underwriting or underwriting positions in order to limit its risk in the event of a prolonged closure of the debt markets.

In a credit transaction, risk acceptability is based first on the borrower's ability to meet its commitments, in particular through the cash flows which will allow the repayment of the debt. For medium and long-term operations, the funding duration must remain compatible with the economic life of the financed asset and the visibility horizon of the borrower's cash flow.

Security interests are sought to reduce the risk of loss in the event of a counterparty defaulting on its obligations, but may not, except in exceptional cases, constitute the sole justification for taking the risk. Security interests are assessed with prudent value haircuts and paying special attention to their actual enforceability.

Complex transactions or those with a specific risk profile are handled by specialised teams within the Group with the required skills and expertise.

The Group seeks risk diversification by controlling concentration risk and maintaining a risk allocation policy through risk sharing with other financial partners (banks or guarantors).

Counterparty ratings are a key criterion of the credit policy and serve as the basis for the credit approval authority grid used in both the commercial and risk functions. The rating framework relies on internal models. Special attention is paid to timely updating of ratings (which, in any event, are subject to annual review)[1].

The risk measure of the credit portfolio is based primarily on the Basel parameters that are used to calibrate the capital need. As such, the Group relies for the internal rating of counterparties on Balois models allowing the assessment of credit quality, supplemented for "non-retail" counterparties, by expert judgment. These measures are complemented by an internal stress-sized risk assessment, either at the global portfolio level or at the sub-portfolio level, linking risk measures and rating migration to macro-economic variables most often to say expert. In addition, the calculation of expected losses under the provisions of IFRS 9, used to determine the level of impairment on healthy outstandings, provides additional insight into assessing portfolio risk.

In consultation with the Risk Department, the businesses implement, most of the time, pricing policies that are differentiated according to the level of risk of counterparties and transactions. The purpose of pricing a transaction is to ensure acceptable profitability, in line with the objectives of ROE (Return on Equity) of the business or entity, after taking into account the cost of the risk of the transaction in question. The pricing of an operation can nevertheless be adapted in certain cases to take into account the overall profitability and the potential customer relationship development. The intrinsic profitability of products and customer segments is subject to periodic analysis in order to adapt to changes in the economic and competitive environment.

Proactive management of counterparties whose situation has deteriorated is key to containing the risk of final loss in the event of counterparty failure. As such, the Group has put in place rigorous procedures for monitoring non retail counterparties and/or for closer monitoring of retail counterparties whose risk profiles are deteriorating. In addition, the businesses and entities, in conjunction with the Risk and Finance Departments, and through collaborators specialising in recovery and litigation, work together to effectively protect the Bank's interests in the event of default.

MEASURES TO MANAGE ESG RISK FACTORS

Concerning ESG risks (Environmental, Social & Governance), the assessment and management of the impact of ESG risk factors on credit risk is based in particular on the establishment of exclusion lists, portfolio alignment indicators (oil and gas and electricity production for example) and sensitivity analyses (in particular transition risk *via* the CCVI or Corporate Climate Vulnerability Index).

In general, credit granting policies must comply with the criteria defined within the framework of the Group's Social and Environmental Responsibility (CSR) policy, which is broken down through:

- the general environmental and social principles and the sectoral and cross-cutting policies appended to them. Sector policies cover sectors considered potentially sensitive from an environmental, social or ethical point of view;
- the targets for alignment with the objectives of the Paris agreement, which the Group has set itself, starting with the sectors with the highest CO_2 emissions;
- commitment to granting sustainable financing classified as Sustainable and Positive Impact Finance and to sustainability linked transactions.

Risks related to climate change (physical and transition risks), which are an aggravating factor in the types of risks facing the Bank must be taken into account in risk assessment processes. An assessment of climate vulnerability (particularly in terms of transition risk) must be provided by the Business Unit for certain specific sectors and may have an impact on the internal rating so that it incorporates the client's adaptation strategy (See also section 4.13 "*Environmental, social and governance risks*" of this Universal Registration Document).

Counterparty credit risk

The future value of exposure to a counterparty as well as its credit quality are uncertain and variable over time, both of which are affected by changes in market parameters. Thus, counterparty credit risk management is based on a combination of several types of indicators:

- indicators of potential future exposures (potential future exposures, or PFE), aimed at measuring exposure to our counterparties:
  - the Group controls idiosyncratic counterparty credit risks *via* a set of CVaR[2] limits. The CVaR measures the potential future exposure linked to the replacement risk in the event of default by one of the Group's counterparties. The CVaR is calculated for a 99% confidence level and different time horizons, from one day until the maturity of the portfolio,
  - in addition to the risk of a counterparty default, the CVA (Credit Valuation Adjustment) measures the adjustment of the value of our portfolio of derivatives and repos account the credit quality of our counterparties;
- the abovementioned indicators are supplemented by stress test impacts frameworks or on nominal ones in order to capture risks that are more difficult to measure:
  - the more extreme correlation risks are measured *via* stress tests at different levels (wrong-way risk, stress monitoring at sector level, risk on collateralised financing activities and agency),

(1) For non-automated processes.
(2) The CVaR economic indicator is built on the same modeling assumptions as the regulatory Effective Expected Positive Exposure (EEPE) indicator used to calculate RWAs.

- the CVA risk is measured *via* a stress test in which representative market scenarios are applied, notably involving the credit spreads of our counterparties;

- exposures to central counterparty clearing houses (CCP) are subject to specific supervision:
  - the amount of collateral posted for each segment of a CCP: the initial posted margins, both for our principal and agency activities, and our contributions to CCP default funds,
  - in addition, a stress test measures the impact linked to (i) the default of an average member on all segments of a CCP and (ii) the failure of a major member on a segment of a CCP;
- the Global Stress Test on market activities includes cross market-counterparty risks, it is described in more detail in the "Market risk" section;
- besides, a specific framework that has been set up aims to avoid individual concentration related to counterparty risk in market operations.

Market risk

The Group's market activities are carried out as part of a business development strategy primarily focused on meeting client requirements through a full range of products and solutions.

Market risk is managed through a set of limits for several indicators (such as stress tests, Value at Risk (VaR) and stressed Value at Risk (SVaR), "Sensitivity" and "Nominal" indicators). These indicators are governed by a series of limits proposed by the business lines and approved by the Risk Division during the course of a discussion-based process.

The choice of limits and their calibration reflect qualitatively and quantitatively the fixing of the Group's appetite for market risks. A regular review of these frameworks also enables risks to be tightly controlled according to changing market conditions with, for example, a temporary reduction of limits in case of a deterioration. Warning thresholds are also in place to prevent the possible occurrence of overstays.

Limits are set at different sub-levels of the Group, thereby cascading down the Group's risk appetite from an operational standpoint within its organisation.

Within these limits, the Global Stress Test limits on market activities and the Market Stress Test limits play a pivotal role in determining the Group's market risk appetite; in fact, these indicators cover all operations and the main market risk factors as well as risks associated with a severe market crisis which helps limit the total amount of risk and takes account of any diversification effects.

Non financial risks (including compliance risk)

Non-financial risks are defined as non-compliance risk, risk of inappropriate conduct, IT risk, cybersecurity risk, other operational risks, including operational risk associated with credit risk, market risk, model risk, liquidity and financing, structural and rate risk. These risks can lead to financial losses.

Governance and a methodology have been put in place for the scope of non-financial risks.

As a general rule, the Group has no appetite for operational risk or for non-compliance risk. Furthermore, the Group maintains a zero-tolerance policy on incidents severe enough to potentially inflict serious harm to its image, jeopardise its results or the trust displayed by customers and employees, disrupt the continuity of critical operations or call into question its strategic focus.

The Group underscores that it has is no or very low tolerance for operational risk involving the following:

- internal fraud: the Group does not tolerate unauthorised trading by its employees. The Group's growth is founded on trust, as much between employees as between the Group and its employees. This implies respecting the Group's principles at every level, such as exercising loyalty and integrity. The Group's internal control system must be capable of preventing acts of major fraud;
- cybersecurity: the Group has zero tolerance for fraudulent intrusions, disruption of services, compromise of elements of its information system, in particular those which would lead to theft of assets or theft of customer data. The Bank aims to put in place effective means to prevent and detect this risk. It has a barometer that measures the degree of maturity of the cybersecurity controls deployed within its entities and the appropriate organisation to deal with any incidents;
- data leaks: trust is the main asset of the Societe Generale Group. Consequently the Group is committed to deploying the necessary resources and implementing controls to prevent, detect and remediate data leaks. It does not tolerate any leaks of its most sensitive information, in particular that of customer data;
- business continuity: the Group relies heavily on its information systems to perform its operations and is therefore committed to deploying and maintaining the resilience of its information systems to ensure the continuity of its most essential services. The Group has very low tolerance for the risk of downtime in its information systems that perform essential functions, in particular systems directly accessible to customers or those enabling to conduct business on financial markets;
- outsourced services: the Group seeks to achieve a high degree of thoroughness in the control of its activities entrusted to external service providers. As such, the Group adheres to a strict policy of reviewing its providers the frequency of which depends on their level of risk;
- managerial continuity: the Group intends to ensure the managerial continuity of its organisation to avoid the risk of a long-term absence of a manager that would question the achievement of its strategic objectives, which might threaten team cohesion or disrupt the Group's relationships with its stakeholders;
- physical security: the Societe Generale Group applies security standards to protect personnel, tangible and intangible assets in all the countries where it operates. The Group Security Department ensures the right level of protection against hazards and threats, in particular through security audits on a list of sites that it defines;
- execution errors: the Societe Generale Group has organised its day-to-day transaction processes and activities through procedures designed to promote efficiency and mitigate the risk of errors. Notwithstanding a robust framework of internal control systems, the risk of errors cannot be completely avoided. The Group has a low tolerance for execution errors that would result in very high impacts for the Bank or its clients.

Structural interest rate and exchange rate risks, risk to employee commitments

The Group measures and strictly controls structural risks. The mechanism whereby rate risk, foreign exchange risk and the risk on pension/long-service obligations is controlled is based on sensitivity or stress limits which are broken down within the various businesses (entities and business lines).

There are four main types of risk: rate level risk, curve risk book, optional risk (arising from automatic options and behavioral options) and basis risk, related to the impact of relative changes in interest rates indices. The Group's structural interest rate risk management primarily relies on the sensitivity of Net Present Value ("NPV") of fixed-rate residual positions (excesses or shortfalls) to interest rate changes according to several interest rate scenarios. The limits are established either by the Board of Directors or by the Finance Committee, at the Business Unit/Service Unit and Group levels. Furthermore, the Group measures and controls the sensitivity of its net interest margin ("NIM") on different horizons.

The Group's policy in terms of structural exchange rate risks consists of limiting as much as possible the sensitivity of its CET1 capital ratio to changes in exchange rates, so that the impact on the CET1 ratio of an appreciation or a depreciation of all currencies against the euro does not exceed a certain threshold in terms of bp by summing the absolute values of the impact of each currency.

Regarding risks to pension and long-service obligations, which are the Bank's long-term obligations towards its employees, the amount of the provision is monitored for risk on the basis of a specific stress test and an attributed limit. The risk management policy has two main objectives: reduce risk by moving from defined-benefit plans to defined-contribution plans and optimise asset risk allocation (between hedge assets and performance assets) where allowed by regulatory and tax constraints.

Structural risk-liquidity and funding risk

Controlling liquidity risk is based primarily on:

- compliance with regulatory liquidity ratios, with precautionary buffers: LCR (liquidity coverage ratio) ratios that reflect a stress situation and NSFR (net stable funding ratio);
- compliance with a minimum survival horizon under combined market and idiosyncratic stress;
- framing of transformation and anti-transformation positions (price risk).

Controlling financing risk is based on:

- maintaining a liability structure to meet the Group's regulatory constraints (Tier1, Total Capital, Leverage, TLAC, NSFR, MREL) and complying with rating agencies' constraints to secure a minimum rating level;
- recourse to market financing: annual long-term issuance programs and a stock of moderate structured issues and short-term financing raised by supervised treasuries.

Model risk

The Group is committed to defining and deploying internal standards to reduce model risk on the basis of key principles, including the creation of three independent lines of defence, the proportionality of due diligence according to each model's level of risk inherent, the consideration of the models' entire lifecycle and the appropriateness of the approaches within the Group.

A wrong design, implementation, use or a non rigorous models monitoring can have two mains unfavorable consequences: an under estimation of equity based of models validated by Regulators and/or financial losses.

Risk model appetite is defined for the perimeter of this group of models: credit risk IRB and IFRS 9, market and counterparty risk, market product valuation, ALM, trading model, compliance and granting.

Risk related to insurance activities

The Group conducts Insurance activities (Life Insurance and Savings, Retirement savings, Property & Casualty Insurance, etc.) which exposes the Group to two major types of risks:

- subscription risk related to pricing and fluctuations in the claims ratio;
- risks related to financial markets (interest rate, credit and equity) and asset-liability management.

Investment risk

The Group has limited appetite for financial holdings, such as proprietary private equity transactions. The investments allowed are mainly related to:

- commercial support for the network through the private equity activity of the Societe Generale and Crédit du Nord network and certain subsidiaries abroad;
- taking stakes, either directly or through investment funds, in innovative companies *via* SG Ventures;
- the takeover of stakes in local companies: Euroclear, *Crédit Logement*, etc., which does not have limit.

Settlement/Delivery risk

The settlement-delivery risk on financial instruments arises when transactions (over-the-counter in cash or forward) give rise to a time lag (usually of a few hours) between the payment and the delivery of the underlying (securities, raw materials, foreign exchange, etc.) during their settlement.

The Group defines a risk appetite for delivery risk in relation to the quality of the counterparty (*via* its rating) with larger limits granted to counterparties in the investment grade category (IG).

4.2.2 RISK APPETITE – GENERAL FRAMEWORK

Risk appetite is determined at Group level and attributed to the businesses and subsidiaries. Monitoring of risk appetite is performed according to the principles described in the Risk Appetite Framework governance and implementation mechanism, which are summarised below.

Governance

As part of the supervision of risk appetite, the Group relies on the following organisation:

- the Board of Directors:
  - approves each year the Group Risk Appetite Statement and the Group Risk Appetite Framework, as well as the Group Risk Appetite Framework,
  - approves in particular the main Group risk appetite indicators (Board of Directors indicators) validated beforehand by General Management,
  - ensures that risk appetite is relevant to the Group's strategic and financial objectives and its vision of the risks of the macro-economic and financial environment,
  - reviews quarterly the risk appetite dashboards presented to it, and is informed of risk appetite overruns and remediation action plans,
  - sets the compensation of corporate officers, sets out the principles of the remuneration policy applicable in the Group, especially for regulated persons whose activities may have a significant impact on the Group's risk profile, and ensures that they are in line with risk management objectives.

  The Board of Directors relies primarily on the Risk Committee;
- General Management:
  - approves the document summarising the Group's risk appetite Statement and its Risk Appetite Framework based on the proposal of the Chief Risk Officer and the Chief Financial Officer,
  - regularly ensures that risk appetite is complied with,
  - ensures the effectiveness and integrity of the risk appetite implementation system,
  - ensures that the risk appetite for the Group's Business Units and eligible subsidiaries/branches is formalised and translated into frameworks consistent with the Group's risk appetite,
  - ensures internal communication of risk appetite and its transposition in the Universal Registration Document.

In addition, the main mission of the Risk Department is to draw up the document summarising the Group's risk appetite, as well as the implementation of a risk management, monitoring and control system.

The Finance Department contributes to setting this risk appetite in the framework of indicators under the responsibility of the Finance Committee (profitability, solvency, liquidity and structural risks).

The Compliance Department is also responsible for instructing the risk appetite setting for indicators falling within its scope.

Risk identification process

The risk identification process is a key process of the Group risk-management framework. It is a Group-wide process to identify all risks that are or might be material. The approach is comprehensive and holistic: it covers all risk types[1] and all Group exposures.

In addition to the annual review of the Group's risk taxonomy yearly reviewed and published in the SG Code, risk identification process is based on two pillars in order to ensure a complete and up-to-date view of all the material risks facing the Group:

- risk management governance and key Committees such as CORISQs or COFI (at Group or Business Unit level), COMCO and New Product Committees making it possible to monitor changes in the risk profile for all types of risk (credit, market, operational, etc.). In addition to monitoring well-identified risks, this governance can also generate a debate between risk experts and senior management on emerging risks. This debate is fueled by the latest market news, early warning signals, internal alerts, and more;
- a series of exercises aimed at identifying additional risks, for example arising from changes in macroeconomic or sectoral conditions, financial markets, regulatory constraints, competitors or market pressure, business model (concentration effects) and changes in banking organisations. These additional identification exercises are also organised by risk types, but include some identification of cross-risk effects (*e.g.* credit and market or credit and operational). For a given type of risk, these exercises analyse and segment the Group's exposure along several axes (Business Unit, activity, customer, product, region, etc.). The underlying risk factors are identified for the perimeters where this risk is assessed as being significant.

When a significant risk is identified, a risk management system, which may include a quantitative risk appetite (risk ceiling or threshold) or a risk policy, is implemented.

In addition, where possible, the risk factors underlying a significant risk are identified and combined in a dedicated scenario, and the associated loss is then quantified by means of a stress test (see also section "Risk quantification and stress test system").

Risk quantification and stress test system

Within the Group, stress tests, a key attribute of risk management, contribute to the identification, measurement and management of risks, as well as to the assessment of the adequacy of capital and liquidity to the Group's risk profile.

The purpose of the stress tests is to cover and quantify, resulting from the Risk Identification annual process, all the material risks to which the Group is exposed and to inform key management decisions. They thus assess what the behavior of a portfolio, an activity, an entity or the Group would be in a degraded business context. It is essential in building the forward-looking approach required for strategic/financial planning. In this context, they constitute a privileged measure of the resilience of the Group, its activities and its portfolios, and are an integral part of the process of developing risk appetite.

(1) Risks are classified on the basis of the Group's risk taxonomy, which names and defines risk categories and their possible sub-categories.

The Group stress testing framework combines stress tests in line with the stress testing taxonomy set by the EBA. Group-wide stress tests should cover all legal entities in the Group consolidation perimeter, subject to risk materiality. Stress test categories are:

- stress tests based on scenarios: application of historical and/or hypothetical conditions but which must remain plausible and in conjunction with the Economic and Sector Studies department, to a set of risk factors (interest rates, GDP, etc.);
- sensitivity stress tests: assessment of the impact of the variation of an isolated risk factor or of a reduced set of risk factors (a shock in rates, credit rating downgrade, equity index shock, etc.);
- reverse stress tests: start with a pre-defined adverse outcome, such as a level of a regulatory ratio, and then identifies possible scenarios that could lead to such an adverse outcome.

The stress test system within the Group thus includes:

- global stress tests.

  Global Group stress tests cover all activities and subsidiaries that are part of the Group's consolidation scope ("Group-wide"), as well as all major risks (including credit risk, market risk, operational risks, liquidity risk). They aim at stressing both the Group P&L and key balance sheet metrics, notably capital and liquidity ratios.

  The central stress test is the overall group stress test, which is based on a central scenario and on adverse macroeconomic scenarios modeled by the Economic Research Department, under the independent supervision of the Group Chief Economist. Macro-economic scenarios are supplemented by other parameters such as capital market conditions, including assumptions on funding.

  The performance of the overall Group stress test is based on the uniform application of the methodology and assumptions at the level of all entities and at Group level. This means that the risk factors, and in particular the macro-economic assumptions used locally, must be compatible with the macro-economic scenario defined by the Group. Entities must submit macro-economic variables to the Group's Economic Studies department to check their consistency.

  The regulatory stress test conducted periodically by the EBA also covers all entities and risks and is scenario-based. Therefore, its execution globally mirrors the process defined for the internal Group Global Stress Test, with an increased involvement of the Group central teams, except for the scenario design which is defined by the supervisor;
- specific stress tests which assess a specific type of risk (market risk, credit risk, liquidity risk, interest rate risk, etc.):
  - credit risk stress tests complement the global analysis with a more granular approach and allow fine-tuning of the identification, assessment and management of risk, including concentration,
  - market stress tests estimate the loss resulting from a severe change in financial market risk factors (equity indexes, interest rates, credit spreads, exotic parameters, etc.). They apply to all Group's market activities and rely on adverse historical and hypothetical scenarios,
  - the operational risk assessment relies on an analysis of historical losses, factoring in internal and external loss data as well as the internal framework and the external environment. This includes losses incurred by international financial institutions, and hypothetical forward-looking "scenario analyses" for all operational risk categories,
  - liquidity stress tests which include: (i) a market-wide scenario that attempts to capture a crisis in which financial markets would undergo an extreme market liquidity disruption causing systemic stress event, and (ii) an idiosyncratic scenario that attempts to capture a firm-specific crisis potentially triggered by a material loss, reputational damage, litigation, executive departures,
  - stress tests which assess the sensitivity to structural interest rate risk concerning the banking book. The exercise focuses on rate variations by stressing (i) the net present value of the positions or (ii) the interest margin and on exchange rate fluctuations on the residual exchange positions,
  - a stress test on employment benefits which consists of simulating the impact of variations in market risk factors (inflation, interest rates, etc.) on the Group's net position (dedicated investments minus the corresponding employment benefits),
  - stress tests on the risk linked to insurance activities defined in the risk appetite of the Insurance Business Unit, which puts stress on risk factors specific to financial and insurance activities to measure and control the main risks relating thereto,
  - climate stress tests based on climate risk scenarios at least once a year. These stress tests may encompass both transition and/or physical risk and may cover short term to medium-long term horizons. These annual climate stress tests can be either global (covering all group exposures) or cover only specific portfolio. Historically, on climate risk, the Group voluntarily participated in exploratory climate stress exercises organised by the ACPR (Prudential Control and Resolution Authority) and the European Banking Authority in 2020. In 2022, the Group also participated in a stress test coordinated by the European Central Bank (ECB) during the first half of the year (see also Chapter 4.13 "Environmental, social and governance risks" p.280),
  - reverse stress tests, both as part of the risk appetite and the recovery plan. The impact of these stress tests is typically defined *via* a breaking point in the solvency ratio or liquidity indicator, which poses a significant threat to the Bank. Hypothetical scenarios leading to this breaking point are then constructed in order to identify new weaknesses.

In addition to internal stress test exercises, the Group is part of the sample of European banks participating in major international stress tests programmes conducted by the European Banking Authority (EBA) and the European Central Bank (ECB).

DEFINITION OF THE "CENTRAL" AND "STRESSED" ECONOMIC SCENARIOS

Central scenario

The central scenario is based first of all on a set of observed factors such as recent economic situation and economic policy shifts (budgetary, monetary and exchange-rate policies). From these observed factors, economists calculate the most likely trajectory of economic and financial variables for the desired forecast horizon.

Stressed scenario

The severity of the stressed scenario, which is determined by the deviation of the GDP trajectory from the central scenario, is based on the magnitude of the 2008-2009 crisis, of the eurozone sovereign crisis, and has been adjusted to take into account the impacts – health, economic and financial – of the Covid-19 crisis on the basis of current knowledge. The severity is constantly compared to that of various adverse scenarios produced by reputable institutions such as the ECB, the Bank of England or the Federal Reserve. In 2022, the Group stress test scenario has been set up in order to take into account the risk of a stagflationary shock.

Setting and formalisation of risk appetite at Group level

The Group's risk appetite is formalised in a document ("Risk Appetite Statement") which sets out:

- the strategic profile of the Group;
- its profile of profitability and financial soundness;
- the frameworks relating to the management of the Group's main risks (qualitative, through risk policies, and quantitative, through indicators).

Regarding the profile of profitability and financial soundness, the Finance Department proposes each year, upstream of the budgetary procedure, to the General Management, limits at Group level, supplemented by alert thresholds and crisis levels according to a "traffic light" approach. These frameworks on financial indicators allow:

- to respect, with a sufficient safety margin, the regulatory obligations to which the Group is subject (in particular the minimum regulatory solvency, leverage and liquidity ratios), by anticipating as best as possible the implementation of new regulations;
- to ensure, *via* a safety margin, sufficient resistance to stress scenarios (stress standardised by regulators or stress defined according to a process internal to the Group).

The frameworks relating to risk management, also represented *via* a graduated approach (limits, alert thresholds, etc.), result from a process in which the needs expressed by the businesses are confronted with a contradictory opinion independent from the second line defence. The latter is based on:

- independent analysis of risk factors;
- the use of prospective measures based on stress approaches;
- the proposal for a framework.

For the main risks, the frameworks set make it possible to consolidate the achievement of the Group's financial targets and to orient the Group's profitability profile.

Allocation of risk appetite in the organisation

The allocation of risk appetite in the organisation is based on the strategic and financial plan, and on risk management systems:

- based on recommendations by the Finance Department to General Management, the financial targets defined at Group level are broken down into financial frameworks(1) at business line level, as part of financial management;
- the breakdown of frameworks and risk policies is based on an understanding of the needs of the businesses and their business prospects and takes into account the profitability and financial strength targets of the Business Unit and/or the entity.

4.2.3 RISK MANAGEMENT ORGANISATION

Audited I Implementing a high-performance and efficient risk management structure is a critical undertaking for Societe Generale Group in all businesses, markets and regions in which it operates, as is maintaining a balance between strong awareness of risks and promoting innovation. The Group's risk management, supervised at the highest level, is compliant with the regulations in force, in particular the order of 3 November 2014 revised by the order of 25 February 2021 on the internal control of companies in the banking sector, Payment Services and Investment Services subject to the control of the French Prudential Supervisory and Resolution Authority (*Autorité de contrôle prudentiel et de résolution* – ACPR) and the final version of European Regulations Basel 3 (CRR/CRD). ▲ (See Board's Expertise, page 89).

Governance of risk management

Audited I Two main high-level bodies govern Group risk management: the Board of Directors and General Management.

General Management presents the main aspects of, and notable changes to, the Group's risk management strategy to the Board of Directors at least once a year (more often if circumstances so require).

As part of the Board of Directors, the Risk Committee advises the Board on overall strategy and appetite regarding all kinds of risks, both current and future, and assists the Board when the latter verifies that the strategy is being rolled out.

(1) A Group framework can be broken down into the businesses through a different indicator; for example, the capital ratios are broken down in the business lines into weighted assets: "RWA".

The Board of Directors' Audit and Internal Control Committee ensures that the risk control systems operate effectively.

Chaired by General Management, the specialised Committees responsible for central oversight of internal control and risk management are as follows:

- **the Risk Committee** (CORISQ), which met 18 times during the 2022 financial year, aims to:
  - validate the main risk management mechanisms (taxonomy, risk identification, stress testing and Risk Appetite Framework),
  - for credit, counterparties, market, operational, model and environmental risks:
    - validate the Group's risk appetite prior to its proposal to the Board of Directors for approval,
    - then define the Group's main risk policy guidelines in the context of the risk appetite previously approved by the Board of Directors,
    - respect the Group's risk appetite as defined and implemented.

  Along with the Risks Committee, the Major Risks Committee (*Comité Grands Risques*) is an *ad hoc* Committee, responsible for approving the sales and marketing strategy and risk-taking with regard to major client groups (Corporates, Insurance Companies and Asset Managers);
- **the Finance Committee** (COFI), chaired by the Chief Executive Officer, is responsible for setting out the Group's financial strategy and for ensuring the management of scarce resources (capital, liquidity, balance sheet, tax capacity) and the management of structural risks. COFI oversees all aspects of the management of the structural risks of the Group and its main entities, including the management of liquidity and financing risks, as well as the management of banking book market risks: interest rate, credit spread, exchange and shares, financial management of scarce resources (liquidity and capital), the dividend policy, monitoring the rating assigned to Societe Generale by credit rating agencies, the recovery and resolution plans, monitoring of the Group's tax capacity, financial management of Corporate Centre and intra-group re-invoicing;
- **the Compliance Committee** (COMCO), chaired by the Chief Executive Officer, reviews the risks of non-compliance, the main issues and defines the Group's compliance principles. It ensures, on an annual basis, the monitoring of the quality of the Embargoes & Sanctions risk management framework. The Committee also reviews the main compliance incidents of the period and the main information related to Supervisor relationships. It reviews and challenges compliance indicators on each area of non-compliance risk. Finally, it validates the compliance risk appetite criteria, the annual roadmap for mandatory Group trainings, the new modules for all employees, and on an *ad hoc* basis certain Group compliance topics. In addition, twice a year, a session dedicated to the review of the regulatory system is organised. Its objective is to ensure the consistency and effectiveness of the compliance system with banking and financial regulations;
- **the Digital Transformation Committee** (DTCO), is Chaired by the Deputy General Manager. The purpose of this Committee, in line with the decisions of the Group Strategic Committee, is to initiate and monitor the transformations of the information system and the associated operating model which require, by their transversal nature or by the extent of the transformation envisaged, a decision of the General Management;
- **the Group Internal Control Coordination Committee (GICCC**), is chaired by the Chief Executive Officer or, in his absence, by a Deputy Chief Executive Officer or by the Deputy Chief Executive Officer in charge of supervising the area under review. The purpose of the GICCC is to ensure the consistency and effectiveness of the Group's internal control, in response in particular to the obligation laid down in Art. 16 of the amended French Order of 3 November 2014. The Committee meets approximately 20 times a year to deal with cross-cutting topics as well as the annual review of each BU and SU;
- **the Non-Financial Risks Steering Committee**, chaired by the Head of DGLE/PIC assisted as co-sponsors by the CRO and CCO, aims to develop and instruct the orientations taken by the Group Internal Control Coordination Committee (GICCC) and resulting from the Audit and Internal Control Committee (CACI), to ensure the consistency, efficiency and effectiveness of the transformations of non-financial risk control (NFR) frameworks, to set targets with regard to roadmaps, to validate, coordinate and manage the evolution of NFR frameworks throughout the Group, to highlight risks and alerts related to NFR frameworks, to provide resources, prioritise and decide on their allocation, by making any necessary arbitrations;
- **the Responsible Commitments Committee** (CORESP), chaired by the Deputy Chief Executive Officer in charge of overseeing the ESG policy, deals with all matters falling within the Group's responsibility in Environmental and Social matters, or those having an impact on the Group's responsibility or reputation and not already covered by an existing Executive Management Committee. The Committee is decision-making and has authority over the entire Group. Its objective is to (i) arbitrate complex transaction/client cases presenting a high reputational risk or non-alignment with the Group's standards in terms of CSR, Culture & Conduct, ethics or reputation; (ii) examine subjects with very high CSR, ethical or reputational risks; (iii) make new Group commitments or change the Group's E&S standards (including sectoral policies); (iv) monitor the implementation of the Group's E&S commitments; (v) examine opportunities for the development of sustainable and positive impact financing or investments, requiring the opinion or validation of the General Management;
- **the Group Provisions Committee** (COPRO), chaired by the Chief Executive Officer, meets quarterly and is tasked with presenting and validating the Group's net risk expense (provisions for the credit risk) that will be accounted for the quarter in question.

Divisions involved in risk management and internal control

The Group's Corporate Divisions, which are independent from the core businesses, contribute to the management and internal control of risks.

The Corporate Divisions provide the Group's General Management with all the information needed to perform its role of managing Group strategy under the authority of the Chief Executive Officer. The Corporate Divisions report directly to General Management:

- **the Risk Division**

  The main role of the Risk Division (RISQ) is to support the development of the Group's activities and profitability by elaborating the Group's risk appetite (allocated between the Group's different business lines) in collaboration with DFIN and the BUs/SUs and establishing a risk management and monitoring system as a second line of defence. In performing its work, the RISQ SU reconciles independence from the businesses with a close working relationship with the BUs, which are responsible in the first instance for the transactions they initiate.

Accordingly, the Risk Division:

- provides hierarchical and functional supervision for the Group's Risk Management Function
- addresses the guidance, with the Finance Service Unit, for setting the Group's risk appetite as submitted to General Management,
- identifies all Group risks,
- implements a governance and monitoring framework for these risks, including cross-business risks, and regularly reports on the nature and extent thereof to General Management, the Board of Directors and the banking supervisory authorities,
- contributes to the definition of risk policies, taking into account the aims of the core businesses and the relevant risk issues,
- defines or validates methods and procedures for the analysis, assessment, approval and monitoring of risk,
- implements a second-level control to ensure the correct application of these methods and procedures,
- assesses and approves transactions and limits proposed by business managers,
- defines or validates the architecture of the central risk information system, ensures its suitability to business requirements;

■ **the Finance Department** (DFIN) coordinates the Finance Management Function and is responsible for the Group's financial management, oversight and production through several complementary tasks:

- fuelling General Management's discussions on strategic and financial aspects. To this end, DFIN takes care to provide a consistent overview of performance indicators and financial information,
- managing, at consolidated level for Societe Generale SA and for certain subsidiaries, the establishment and analysis of financial, tax and regulatory statements (regulatory indicators regarding scarce resources, regulatory reports, ICAAP and ILAAP documentation) in compliance with applicable standards and obligations,
- monitoring and overseeing P&L performance, profitability and scarce resources (capital, liquidity, balance sheet) in line with strategic objectives and in accordance with regulatory obligations,
- supporting the Business Units and Service Units with financial and strategic oversight,
- managing liquidity, in particular through the implementation of financing and resilience plans, in accordance with the objectives set by the Group and in compliance with the Group's risk appetite,
- maintaining financial crisis management plans tailored to the Group's configuration,
- ensuring the management and first-level monitoring of structural interest rate, foreign exchange and liquidity risks as defined in Book B Title V Chapter 6. RISQ assuming the role of second line of defence,
- performing regulatory watch with respect to scarce resources, accounting and finance, and participating in institutional relations and advocacy with its main peers and with banking federations,
- acting as enterprise architect for all activities performed by the Group's Finance Divisions;

■ **the Group Compliance Division** is responsible for the definition and consistency of the non-compliance risk prevention and control framework, related to banking and financial regulation and for coordinating the framework aimed at preventing, identifying, assessing and controlling non-compliance risk across the entire Group. It ensures that roles and responsibilities are identified with the appropriate level of expertise so that the regulatory watch framework and related normative documentation, including its deployment, are operational. In particular, it takes care to harmonise procedures and optimise (in conjunction with the BU/SUs) international resources in order to ensure the framework's effectiveness and compliance with its rules. Within this framework, it has hierarchical and functional authority over the compliance teams of Group entities.

The Group Compliance Service Unit is organised around three broad categories of non-compliance risks:

- financial security: know your client (KYC); compliance with the rules and regulations on international sanctions and embargoes; anti-money laundering and counter-terrorist financing (AML/CTF), including reporting suspicious transactions to the appropriate financial intelligence authority when necessary,
- regulatory risks: customers protection; integrity of the financial markets; countering bribery and corruption, ethics and good conduct; compliance with regulations related to tax transparency (based on knowledge of clients' tax profile); compliance with regulations on social and environmental responsibility and the Group's commitments,
- protection of data, including personal data and in particular those of customers;

■ **the General Secretariat** within its fields of expertise, is assigned with the mission of protecting the Bank in order to further its development. Together with the SUs, BUs and other Societe Generale Group entities, it ensures the administrative, legal and tax compliance of the Group's activities, both in France and abroad. It is in charge of managing legal and tax risks. It also oversees global Group security (together with the RESG SU in respect of IT systems security), designs and implements the risk insurance policy for the entire Group and its staff, and provides assistance in developing insurance products for the Group's clients. It devises and oversees the development of corporate social responsibility and public affairs and institutional relations/advocacy initiatives within the Societe Generale Group. Lastly, it handles the Group's central administration and offers support to the Secretary of the Board of Directors as necessary;

■ **the Human Resources Department** is tasked with defining and implementing the general and individual policies designed to enable the Group to develop the skills and talent needed for its strategy to succeed. The Division's role as partner to the businesses is key to the Group's adaptation to its environment;

■ **the Corporate Resources and Innovation Department** accompanies the digital transformation and promotes operational efficiency for the Group. It supervises the Resource Management Functions (Information Systems, Sourcing and Property);

■ **the Group Internal Audit and General Inspection Department**, under the authority of the General Inspector, is in charge of internal audit; finally

■ **the Sustainable Development Department** attached to the general Management, the Group Sustainable Development Division (DGLE/RSE) assists the Deputy Chief Executive Officer in charge of the whole ESG policies (Environmental, Social and Governance) (RSE – Corporate Social Responsibility-) and their actual translation in the business lines and functions trajectories. It supports the Group ESG transformation to make it a major competitive advantage, in the business development as well as in the ESG (Environmental & Social) risks management. DGLE/RSE provides an advising mission to the General Management through three main tasks:

- the definition and strategic steering of the Group's ESG ambition,
- the support of the BUs' and SUs' ESG transformation,
- the contribution to promoting the Group's ESG reach. ▲

According to the last census carried out on 31 December 2022, the full-time equivalent (FTE) workforce of:

- the Group's Risk Department for the second line of defence represents approximately 4,475 FTEs (1,671 within the Group's Risk Department itself and 2,804 for the rest of the Risk function);
- the Compliance Department or the second line of defence represents approximately 2,934 FTEs;
- the Information System Security Department totals approximately 549 FTEs.

Risk reporting and assessment systems

The Group's risk measurement systems serve as the basis for the production of internal Management Reports allowing the monitoring of the Group's main risks (credit risk, counterparty, market, operational, liquidity, structural, settlement/delivery) as well as the monitoring of compliance with the regulatory requirements.

The risk reporting system is an integral part of the Group's risk management system and is adapted to its organisational structure. The various indicators are thus calculated at the level of the relevant legal entities and Business Units and serve as the basis for the various reportings. Departments established within the Risk, Finance and Compliance sectors are responsible for measuring, analysing and communicating these elements.

Since 2015, the Group has defined architecture principles common to the Finance and Risk functions, the TOM-FIR principles (Target Operating Model for Finance & Risk), in order to guarantee the consistency of the data and indicators used for internal management and regulatory production. The principles revolve around:

- Risk and Finance uses, whether at the local level and at the various levels of consolidation subject to an organised system of "golden sources", with a collection cycle adapted to the uses;
- common management rules and language to ensure interoperability;
- consistency of Finance and Risk usage data, *via* strict alignment between accounting data and management data.

The Group produces, *via* all of its internal reports for internal monitoring purposes by the Business Units and Service Units, a large number of **risk metrics** constituting a measure of the risks monitored. Some of these metrics are also produced as part of the transmission of regulatory reports or as part of the publication of information to the market.

The Group selects from these metrics a set of **major metrics**, able to provide a summary of the Group's risk profile and its evolution at regular intervals. These metrics concern both the Group's financial rating, its solvency, its profitability and the main risks (credit, market, operational, liquidity and financing, structural, model) and are included in the reports intended for internal management bodies.

They are also subject to a framework defined and broken down in line with the Group's risk appetite, giving rise to a procedure for reporting information in the event of breaches.

Thus, the risk reports intended for the management bodies are guided in particular by the following principles:

- coverage of all significant risks;
- combination of a global and holistic view of risks and a more in-depth analysis of the different types of risk;
- overview supplemented by focus on certain specific scopes, forward-looking elements (based in particular on the presentation of elements on the evolution of the macro-economic context) and elements on emerging risks;
- balance between quantitative data and qualitative comments.

The main Risk reports for management bodies are:

- monthly reporting to the Risk Committee of the Board of Directors aims to provide an overview of changes in the risk profile.

  This reporting is complemented by dashboard for monitoring the Group's Risk Appetite Statement indicators is also sent quarterly to the Board of Directors. These indicators are framed and presented using a "traffic light" approach (with distinction between thresholds and limits) in order to visually present monitoring of compliance with risk appetite. In addition, a compliance dashboard and a reputation dashboard are sent to the Risk Committee of the Board of Directors and provide an overview of each non-compliance risk;
- monthly reporting to the Group Risk Committee (CORISQ), for the general management, aims to regularly provide this Committee with a risk analysis under its supervision, with a greater level of detail than reporting to the Risk Committee of the Board of Directors. In particular, a summary of the main credit files over the period covered by the reporting is presented;
- reporting to the Finance Committee (COFI) for General Management gives rise in particular to the following two reports: a "Scarce resources trajectory" report allowing budget execution to be monitored and a "Structural risk monitoring (ALM)" report" making it possible to monitor compliance with the thresholds and limits relating to liquidity risks and structural interest and exchange rate risks;
- the quarterly reporting of the Group Compliance Committee (COMCO) to General Management: the COMCO provides *via* dedicated reporting an overview of the main non-compliance risks, raises points of attention on compliance topics Group, decides on the main orientations and defines the Group principles in terms of compliance;
- the quarterly reporting of the Provisions Committee (COPRO) to General Management is intended to provide an overview of changes in the level of provisions at Group level. In particular, it presents the change in the net charge of the cost of risk by pillar, by Business Unit and by stage;
- reporting by the Group Internal Control Coordination Committee (GICCC) to General Management: this Committee reviews, on the basis of a standardised dashboard for all Business Units/Service Units, the efficiency and the consistency of the permanent control system implemented within the Group, as well as, within the framework of the Risk Internal Governance Assessment (RIGA) process, the ability of the Risk function to exercise its role as the 2nd line of defence in the whole group. Finally, the Risk Department contributes, as a permanent member, to all GICCC meetings, through position papers on the subjects under review.

Although the above reports are used at Group level to monitor and review the Group's risk profile in a global manner, other reports are transmitted to the Board of Directors or to the General Management in order to monitor and control certain types specific risks.

Ad hoc reports can also be produced. By way of illustration, the Group had to adapt its risk management system from the start of the Covid-19 crisis in March 2020. Dedicated reports had been set up for the General Management, the Board of Directors or the supervisor, on a regular basis and containing indicators adapted to the context.

Additional information on risk reporting and assessment systems by type of risk is also presented in the following chapters.

INTEREST RATE BENCHMARK REFORM

Presentation of the reform

Audited I The interest rate benchmark reform (IBOR: InterBank Offered Rates), initiated by the Financial Stability Board in 2014, aims at replacing these benchmark rates with alternative rates, in particular the Risk-Free Rates (RFR). This reform accelerated on 5 March 2021, when the British Financial Conduct Authority (FCA), the supervisor of LIBOR, announced the official dates for the cessation and loss of representativeness of these benchmarks:

- EUR LIBOR and CHF LIBOR (all terms); GBP LIBOR and JPY LIBOR (terms: overnight, one week, two months and twelve months); USD LIBOR (terms: one week and two months): the publication of these benchmark settings has permanently ceased as of 1 January 2022;
- GBP LIBOR and JPY LIBOR (terms: one, three and six months): these settings have not been contributed by banks since 1 January 2022 and have been published in a synthetic form; their use is thus restricted to the run-off management of legacy positions. Nonetheless, the FCA has announced the cessation of these synthetic benchmarks as follows:
  - JPY LIBOR (terms: one, three and six months): end December 2022,
  - GBP LIBOR (terms: one and six months): end March 2023,
  - GBP LIBOR (term: three months): end March 2024;
- USD LIBOR (terms: overnight, one, three, six and twelve months): the cessation of the publication of these benchmark settings contributed by a panel of banks is scheduled for end June 2023.

In parallel, other indices based on USD LIBOR will be phased out at end June 2023: USD LIBOR ICE SWAP RATE, MIFOR (India), PHIREF (Philippines), SOR (Singapore) and THBFIX (Thailand).

Furthermore, the announced cessation date for the publication of the MosPrime (Russia) is 30 June 2023.

Regarding the major interest rate benchmark indices of the euro area:

- EURIBOR: EMMI (European Money Markets Institute), the administrator of the index, does not plan to cease its publication. The EURIBOR will thus be maintained in the coming years;
- EONIA: its publication definitively ceased on 3 January 2022. The successor benchmark rate recommended by the European Central Bank working group on the euro area interest rates is the €STR on which the EONIA had been based since end 2019.

Impact of the reform for the Societe Generale Group

The Societe Generale Group supports these reforms and takes an active part in the working groups set up by the central banks of the currencies concerned. The Group is actively preparing for these changes, through a specific transition program set up in the Summer of 2018 and supervised by the Finance Division.

For this purpose, the Group has undertaken active awareness and communication campaigns for its customers, supplemented by a monthly newsletter and a Frequently Asked Questions (FAQ) page on the IBOR transition publicly available on the Societe Generale website. To prepare for the announced cessation dates of LIBOR and other transitioning benchmarks, the public authorities and the working groups set up by the central banks issued recommendations to the banking industry. These recommendations aim at stopping the production of new contracts referencing these indices as well as at migrating the existing contracts referencing said indices to alternative benchmark rates.

To ensure a consistent approach throughout the Societe Generale Group, an internal Committee has been formed. Its role is to issue periodical orientations reflecting the market developments and the recommendations from regulators and their working groups. Several internal guidelines have been issued covering four main themes:

- strengthening of the new contracts through the inclusion of fallback clauses and risk warnings;
- cessation of the production of new transactions referencing ceasing benchmarks (with some exceptions provided for by regulators) and use of alternative solutions;
- fair and homogenous treatment of customers through the involvement of the compliance teams in the renegotiations of contracts;
- reporting obligation, and restrictions related to the use of certain interest rates as alternatives to LIBOR.

At this stage, all directives are being applied and widely circulated among the Group's staff.

In order to build the capacity to deal on products referencing RFRs or some term RFRs and thus ensure the continuity of its business after the phasing out of IBOR, the Societe Generale Group updated its tools and processes in line with the major calculation methods recommended by the relevant working groups or professional associations. Nevertheless, the Group continues monitoring developments in the use of RFRs and other alternative rates in order to implement any new convention and meet its customers' needs.

GBP LIBOR, CHF LIBOR, EUR LIBOR, JPY LIBOR and EONIA migration

Until the end of 2021, the Group primarily centred its work on renegotiating transactions with its clients and transitioning all the contracts indexed on the benchmarks terminated or not representative anymore at the end of 2021.

Since Q2 2022, the Societe Generale Group has finalised the transition of all the contracts indexed on the above-mentioned benchmarks.

USD LIBOR and USD LIBOR ICE SWAP RATE migration

The Societe Generale Group has initiated the migration of its stock of operations indexed on USD LIBOR and USD LIBOR ICE SWAP RATE aiming to finalise it by June 2023.

To do this, the Group employs interactions with its customers to offer a proactive transition to alternative solutions.

The Group's customers most concerned by the transition of their contracts are, primarily, customers of the investment banking and Financing and Advisory activities and, to a lesser extent, some of the customers of the Group's French and International retail networks.

The identification of the contracts concerned and the strategy for transitioning the transactions indexed on USD LIBOR have been finalised for all products:

- loans and credit lines are migrated mostly through a bilateral negotiation, and so are the related hedging instruments, in order to maintain their effectiveness;
- the migration of interest rate derivatives is scheduled to be implemented in large part in the first half of 2023, in line with the key milestones set by the clearing houses or by the activation of fallback clauses (ISDA Protocol to which Societe Generale has been adhering since 2020, in particular for USD LIBOR). However, some derivatives contracts are renegotiated bilaterally; lastly
- current accounts and other similar cash products are migrated through an update of their general conditions.

The operational migration of the contracts referencing the USD LIBOR makes use of the processes and tools already developed for the migration of the contracts referencing IBOR interest rates ending at end 2021, as well as of the experience gained. The clearing houses' transition plan is known in advance and based on the experience gained from previous migrations.

Other benchmark rates migration (MIFOR, PHIREF, SOR, THBFIX and MosPrime)

For these rates, the identification of the customers and transactions has been completed. The impact is much smaller than for USD LIBOR. At the level of the Societe Generale Group, these benchmark transitions impact only investment banking products.

The migration strategies are nevertheless similar to those applicable to the USD LIBOR as described above.

The Societe Generale Group keeps monitoring the announcements from regulators and administrators in other jurisdictions in order to react proactively and adapt its migration strategy accordingly.

The table below presents an estimate of the exposures, as at 31 December 2022, related to the contracts impacted by the benchmark reform and whose term is scheduled beyond the official cessation dates.

This table has been produced based on the project monitoring data and on the legal status of the contracts migration.

AUDITED I TABLE 1: FINANCIAL ASSETS AND LIABILITIES AND DERIVATIVES IMPACTED BY THE INTEREST RATE BENCHMARKS REFORM

(In EURbn)			2022		
			Outstanding principal		Notional[1]
Current interest rate benchmarks[5]	New risk-free rates liable to replace the current interest rate benchmarks	Cotation end date	Financial assets[2] (excl. derivatives) impacted by the reform	Financial liabilities[3] (excl. derivatives) impacted by the reform	Derivatives[4] impacted by the reform
EONIA – Euro OverNight Index Average	Euro Short-Term Rate (€STR)	31.12.2021			
LIBOR – London Interbank Offered Rate – GBP	Reformed Sterling Overnight Index Average (SONIA)	31.12.2021			
LIBOR – London Interbank Offered Rate – CHF	Swiss Average Rate Overnight (SARON)	31.12.2021			
LIBOR – London Interbank Offered Rate – JPY	Tokyo OverNight Average (TONA)	31.12.2021			
LIBOR – London Interbank Offered Rate – EUR	Euro Short-Term Rate (€STR)	31.12.2021			
LIBOR – London Interbank Offered Rate – USD	Secured Overnight Financing Rate (SOFR)	30.06.2023	27	1	1,899
USD LIBOR Ice Swap rate (CMS)	USD SOFR Ice Swap rate (CMS)	30.06.2023		12	228
SOR – Singapore Dollar Swap Offer Rate	Singapore Overnight Rate Average (SORA)	30.06.2023			3
MIFOR (INR)	Modified MIFOR	30.06.2023			3
PHIREF (PHP)	No alternative rate defined by regulators	30.06.2023			
THBFIX (THB)	THOR	30.06.2023			
MOSPRIME (RUB)	RUONIA	30.06.2023			6

(1) Notional used in combination with an interest rate benchmark in order to calculate derivative cash flows.
(2) Including accounts receivable, loans, securities received under repurchase agreements, debt securities bearing interest at variable rates.
(3) Including deposits, borrowings, transactions on securities delivered under repurchase agreements, debt issued in the form of securities bearing interest at variable rates.
(4) Including firm instruments (swaps and futures) and conditional instruments.
(5) Only the major interest rate benchmarks impacted by the IBOR reform are presented in this table.

RISKS ASSOCIATED WITH RATE REFORM

Audited I The risks related to the IBOR reform are now mainly limited to USD LIBOR for the period running until June 2023. They are managed and monitored within the governance framework dedicated to the IBOR transition. They have been identified as follows:

- program governance and execution risk, liable to cause delays and loss of opportunities, is monitored as part of the work of regular Committees and arbitration bodies;
- legal documentation risk, liable to lead to post-transition litigations, is managed through fallback clauses inserted in the contracts depending on the availability of market standards;
- market risk, with the creation of a basis risk between the rate curves associated with the different indexes, is closely monitored and supervised;
- operational risks in the execution of the migration of transactions depend in particular on the willingness and preparedness of our counterparties, the volume of transactions to be migrated and their spread over time;
- regulatory risk is managed according to the Group guidelines in line with the recommendations of the regulators and working groups on the LIBOR transition;
- conduct risk, related to the end of LIBOR, is notably managed through:
  - specific guidelines on the appropriate conduct detailed by business line,
  - training of the teams,
  - communications to customers (conferences, events, bilateral discussions in particular with the less informed customers) are organised on the transition-related risks, the alternative solutions that may be implemented, and on how they might be affected. ▲

4.3 INTERNAL CONTROL FRAMEWORK

4.3.1 INTERNAL CONTROL

Internal control is part of a strict regulatory framework applicable to all banking institutions.

In France, the conditions for conducting internal controls in banking institutions are defined in the Order of 3 November 2014, modified by the Order of 25 February 2021. This Order, which applies to all credit institutions and investment companies, defines the concept of internal control, together with a number of specific requirements relating to the assessment and management of the various risks inherent in the activities of the companies in question, and the procedures under which the supervisory body must assess and evaluate how the internal control is carried out.

The Basel Committee has defined four principles – independence, universality, impartiality, and sufficient resources – which underpin the internal control carried out by credit institutions.

The Board of Directors ensures that Societe Generale has a solid governance system and a clear organisation ensuring:

- a well-defined, transparent and coherent sharing of responsibilities;
- effective procedures for the detection, management, monitoring and reporting of risks to which the Company could be exposed.

The Board tasks the Group's General Management with rolling out the Group's strategic guidelines to implement this set-up.

The Audit and Internal Control Committee is a Board of Directors' Committee that is specifically responsible for preparing the decisions of the Board in respect of internal control supervision.

As such, General Management submits reports to the Audit and Internal Control Committee on the internal control of the Group. The Committee monitors the implementation of remediation plans when it considers the risk level to be justified.

Internal control is based on a **body of standards and procedures.**

All Societe Generale Group activities are governed by rules and procedures contained in a set of documents referred to collectively as the "Standard Guidelines", compiled in the Societe Generale Code, which:

- set out the rules for action and behavior applicable to Group staff;
- define the structures of the businesses and the sharing of roles and responsibilities;
- describe the management rules and internal procedures specific to each business and activity.

The Societe Generale Code groups together the standard guidelines which, in particular:

- define the governance of the Societe Generale Group, the structures and duties of its Business Units and Services Units, as well as the operating principles of the cross-business systems and processes (Codes of Conduct, charters, etc.);
- set out the operating framework of an activity and the management principles and rules applicable to products and services rendered, and also define internal procedures.

The Societe Generale Code has force of law within the Group and falls under the responsibility of the Group Corporate Secretary.

In addition to the Societe Generale Code, operating procedures specific to each Group activity are applied. The rules and procedures in force are designed to follow basic rules of internal control, such as:

- segregation of functions;
- immediate, irrevocable recording of all transactions;
- reconciliation of information from various sources.

Multiple and evolving by nature, risks are present in all business processes. Risk management and control systems are therefore key to the Bank's ability to meet its targets.

The internal control system is represented by all methods which ensure that the operations carried out and the organisation and procedures implemented comply with:

- legal and regulatory provisions;
- professional and ethical practices;
- the internal rules and guidelines defined by the Company's management body of the undertaking in its executive function.

Internal control in particular aims to:

- prevent malfunctions;
- assess the risks involved, and exercise sufficient control to ensure they are managed;
- ensure the adequacy and effectiveness of internal processes, particularly those which help safeguard assets;
- detect irregularities;
- guarantee the reliability, integrity and availability of financial and management information;
- check the quality of information and communication systems.

The internal control system is based on **five basic principles:**

- the comprehensive scope of the controls, which cover all risk types and apply to all the Group's entities;
- the individual responsibility of each employee and each manager in managing the risks they take or supervise, and in overseeing the operations they handle or for which they are responsible;
- the responsibility of functions, in line with their expertise and independence, in defining normative controls and, for three of them, exercising second-level permanent control;
- the proportionality of the controls to the materiality of the risks involved;
- the independence of internal auditing.

The internal control framework is based on the **"three lines of defence"** model, in accordance with the Basel Committee and European Banking Authority guidelines:

- the **first line of defence** comprises all Group employees and operational management, both within the Business Units and the Services Units in respect of their own operations.

  Operational management is responsible for risks, their prevention and their management (by putting in place first-level permanent control measures, amongst other things) and for implementing corrective or remedial actions in response to any deficiencies identified by controls and/or process steering;

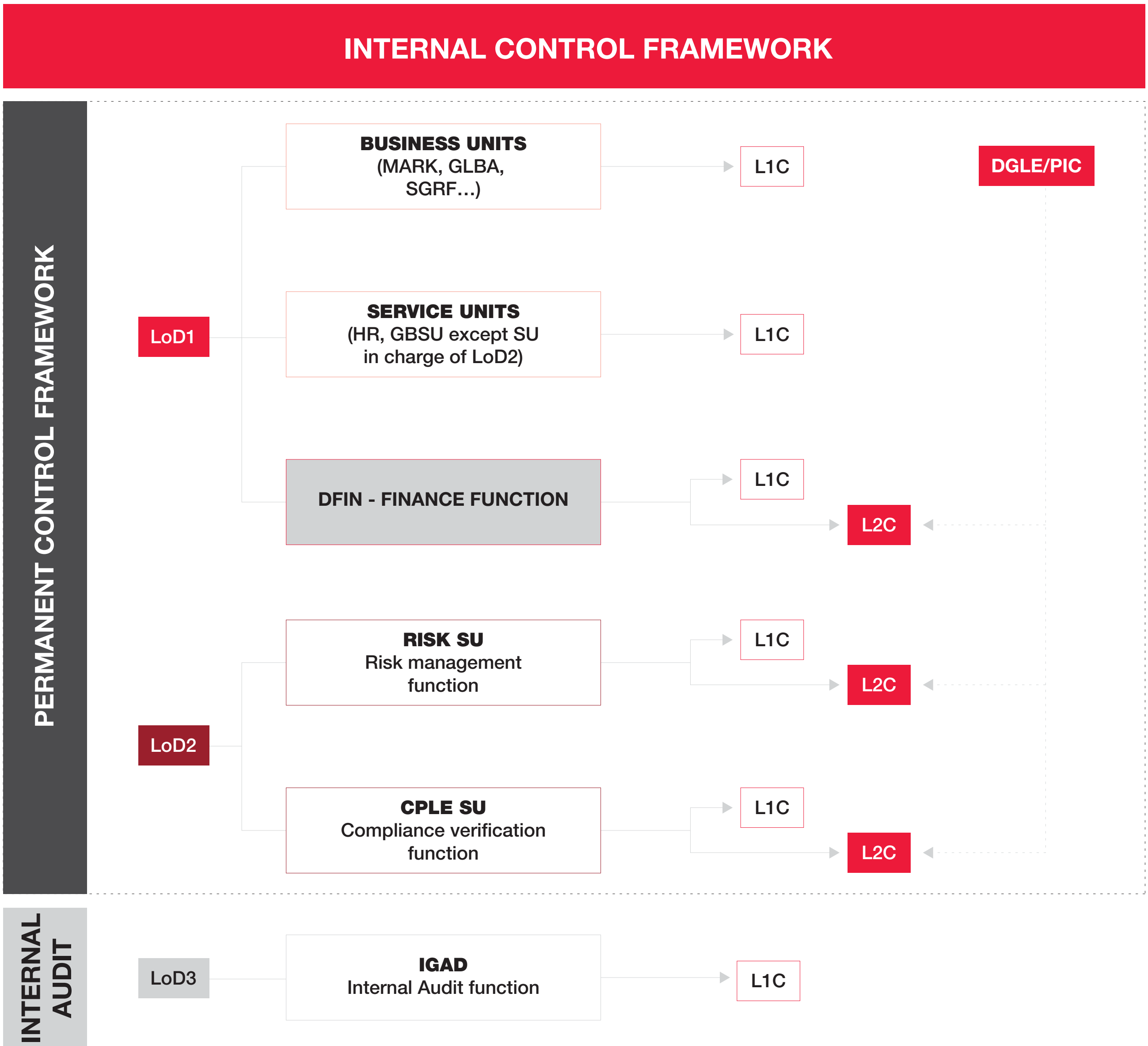
- the **second line of defence** is provided by the risk and compliance functions.

  Within the internal control framework, operational management is responsible for verifying the proper and continuous running of the risk security and management operation functions through the effective application of established standards, defined procedures, methods and requested controls.

  Accordingly, these functions must provide the necessary expertise to define in their respective fields the controls and other means of risk management to be implemented by the first line of defence, and to ensure that they are effectively implemented; they conduct second-level permanent control over all of the Group's risks, based in particular on the controls they have defined, as well as those defined, if necessary, by other expert functions (*e.g.* sourcing, legal, tax, human resources, information system security, etc.) and by the businesses;

- the **third line of defence** is provided by the Internal Audit Department, which encompasses the General Inspection and Internal Audit functions. This department performs periodic internal audits that are strictly independent of the business lines and the permanent control function;

- **internal control coordination,** which falls under the responsibility of the Chief Executive Officer, is also provided at Group level and is rolled out in each of the departments and core businesses.



The Chief Executive Officer is responsible for ensuring the overall consistency and effectiveness of the internal control system.

The purpose of the Group Internal Control Coordination Committee (GICCC) is to ensure the consistency and effectiveness of the Group's internal control, in response in particular to the obligation laid down in Art. 16 of the amended French Order of 3 November 2014. The Committee is chaired by the Chief Executive Officer, or in his absence, by a Deputy General Manager or by the Deputy Chief Executive Officer tasked with supervising the area under review. When it meets, the CCCIG convenes the Manager responsible for Coordinating the Internal Control function, the Permanent Control function, the Managers of the second line of defence (CPLE and RISQ), the Representatives appointed by the Heads of DFIN and RESG (including the Global CISO), the Manager of the third line of defence (IGAD) and as observers, the Head of Operational Risks, as well as the Heads of the level 2 permanent control central teams (RISQ/CTL, CPLE/CTL, DFIN/CTL).

The Committee meets approximately 20 times a year to deal with cross-cutting topics, as well as the annual review of each BU/SU.

Its objectives are:

- to give a consolidated view of the Group's internal control to the General Management;
- to evaluate the Group's permanent control system in terms of effectiveness, consistency and completeness;
- to evaluate the functioning of the Group's permanent control framework based on the review of the Group's quarterly dashboard of permanent controls, supplemented by cross-cutting thematic reviews and by the independent review of RISQ and CPLE in the exercise of their role as the second line of defence for the Group;
- to examine and validate the Group's annual internal control report (ICR);
- to define the roles and responsibilities of the stakeholders of the permanent control and of the GICCC and CCCI and to validate the operational principles of permanent control and governance;
- to validate the sections dealing with internal control in the SG Code (in particular, Title IV of Book A);
- to validate the decisions of the Committee in terms of permanent control framework;
- to review and challenge the permanent control framework of BU/SU;
- to review other cross-cutting topics related to the permanent control of the Group.

The organisation put in place at Group level to coordinate action by each of the various internal control functions is rolled out in each Business Unit (BU) and Service Unit (SU). All Group BUs and SUs have internal control coordination committees. These committees are chaired by the BU or SU manager and convene the managers of the competent permanent and internal audit control functions, as well as the representatives of the Manager of the Group's internal control coordination function and the Group Heads of the control functions.

Permanent control system

The Group's permanent control system comprises:

- the **first-level permanent control,** which is the basis of the Group's permanent control, is performed by the businesses. Its purpose is to ensure the security, quality, regularity and validity of transactions completed at operational level;
- the **second-level permanent control,** which is independent of the businesses and concerns three departments, *i.e.* the Compliance, Risk and Finance Departments.

In 2018, General Management initiated a transformation programme of the Group's permanent control system, which is under its direct supervision. Through a set of actions focusing on areas such as standards, methods, tools, procedures and training, the programme served to consolidate the control culture and optimise risk control, and thus helps to improve the quality and the reliability of services provided to our customers and partners. The programme was finalised and brought to an end in 2021, and the transfer of the long-term activities to operating teams was completed.

FIRST-LEVEL PERMANENT CONTROL

Permanent Level 1 controls, carried out on operations performed by BUs and the SUs, ensure the security and quality of transactions and the operations. These controls are defined as a set of provisions constantly implemented to ensure the regularity, validity, and security of the operations carried out at operational level.

The permanent Level 1 controls consist of:

- **any combination of actions and/or devices that may limit the likelihood of a risk occurring or reduce the consequences for the Company:** these include controls carried out on a regular and permanent basis by the businesses or by automated systems during the processing of transactions, automated or non-automated security rules and controls that are part of transaction processing, or controls included in operational procedures. Also falling into this category are the organisational arrangements (*e.g.*, segregation of duties) or governance, training actions, when they directly contribute to controlling certain risks;
- **controls performed by managers:** line managers control the correct functioning of the devices for which they are responsible. As such, they must apply formal procedures on a regular basis to ensure that employees comply with rules and procedures, and that Level 1 controls are carried out effectively.

Defined by a Group entity within its scope, Level 1 controls include controls (automated or manual) that are integrated into the processing of operations, proximity controls included in operating procedures, safety rules, etc. They are carried out in the course of their daily activities by agents directly in charge of an activity or by their managers. These controls aim to:

- ensure the proper enforcement of existing procedures and control of all risks related to processes, transactions and/or accounts;
- alert management in the event of identified anomalies or malfunctions.

Permanent Level 1 controls are set by management and avoid, as far as possible, situations of self-assessment. They are defined in the procedures and must be traced without necessarily being formalised, *e.g.* preventive automated controls that reject transactions that do not comply with system-programmed rules.

In order to coordinate the operational risk management system and the permanent Level 1 control system, the BUs/SUs use a specific department called CORO (Controls & Operational Risks Office Department).

SECOND-LEVEL PERMANENT CONTROL

The permanent Level 2 control ensures that the Level 1 control works properly:

- the scope includes all permanent Level 1 checks, including managerial supervision checks and checks carried out by dedicated teams;
- this review and these audits aim to give an opinion on (i) the effectiveness of Level 1 controls, (ii) the quality of their implementation, (iii) their relevance (including, in terms of risk prevention), (iv) the definition of their *modus operandi*, (v) the relevance of remediation plans implemented following the detection of anomalies, and the quality of their follow-up, and thus contribute to the evaluation of the effectiveness of Level 1 controls.

The permanent level 2 control, control of the controls, is carried out by teams independent of the operational.

These controls are performed centrally by dedicated teams within Risk Service Unit (RISQ/CTL), Compliance Service Unit (CPLE/CTL) and Finance Service Unit (DFIN/CTL) and locally by the second-level control teams within the BU/SUs or entities.

Internal audit

The Group's Internal Audit function is delivered by the Service Unit Inspection and Internal Audit ("IGAD"), which brings together the Group's Inspection and Internal Audit Departments. The Group's Head of Inspection and Audit has a Group-wide responsibility for the internal audit function.

The Internal Audit function is part of the Group's internal control set-up. It provides the third and last line of defence and performs internal audit controls. The third line of defense is strictly independent from the businesses and other lines of control.

The internal audit mandate performed by IGAD, defined in line with the IIA Standards (Institute of Internal Auditors), is an independent and objective activity that provides the Group with an assurance as to how effectively it is controlling its risks and operations, advises on improvements and contributes to the creation of added value. By carrying out this mandate, Inspection and Internal Audit help the Group to achieve its targets by evaluating systematically and methodically its processes for risk management, control and corporate governance and making recommendations to increase their efficiency.

IGAD's internal audit mandate covers Societe Generale SA and all of the Group's entities and business activities. All businesses, operations and processes without exceptions can be subject to an audit carried out by either Inspection or Internal Audit. That said, entities in which the Group holds a minority stake are excluded, even if the Group has a significant influence, except in cases where such a situation is likely to have a significant impact for the Group on its risk management.

Outsourced activities are also included in the scope of the mandate of IGAD as the Group's internal audit function.

The Group Head of Inspection and Audit reports directly to the Group Chief Executive Officer.

The Chief Executive Officer meets with the Chairman of the Board of Directors on a regular basis. As mentioned in the Internal Rules of the Board, updated in August 2022, the Group Head of Inspection and Audit reports on the execution of the internal audit mandate to the Board of Directors on the basis of presentations made to the Group's Audit and Internal Control Committee. He presents the Group's audit and inspection plan, approved by the Chief Executive Officer, to the Board of Directors following its examination by the Group's Audit and Internal Control Committee.

The Group Head of Inspection and Audit attends all meetings of the Board's Audit and Internal Control Committee and on reguasiprovides the Committee a presentation of the activity of Internal Audit and General Inspection as well as on the status of implementation of recommendations issued both by IGAD and by supervisors (the ECB and the ACPR). He also attends all meetings of the Board's Risk Committee. Both the Audit and Internal Cobntrol Committee and the Risk Committee are briefed by the Group Head of Inspection and Audit, possibly at his request.

As foreseen in the Internal Rules of the Board, if necessary, in the event of changes in the risks affecting or likely to affect the Company, the Group Head of Inspection and Audit may report to the Board of Directors, directly or through the Audit and Internal Committee, without referring to the Effective Senior Managers.

To perform its duties , the Group's IGAD Service Unit is given adequate resources from a qualitative and quantitative point of view. The Group's Inspection and Audit Service Unit has about 1,000 employees located at Head Office and within affiliates and branches (France and overseas).

The Service Unit IGAD operates as a hierarchically integrated division. General Inspection, based at Head Office, has a Group-wide mandate. The various Audit Departments are each in charge of a defined scope of businesses or risks. Whether they are based at Head Office or within entities (subsidiaries or branches), Audit Departments all report to the IGAD Service Unit. A matrix organisation allows to cover important transversal topics at Group level. Depending on resources and skills required, an audit mission can bring together auditors from different departments. IGAD may decide to send any audit team to carry out a mission within the Group.

General Inspection and Audit carry out their roles on the basis of missions. Beyond audit missions defined in the yearly plan, General Inspection can be called to perform analysis and study missions or contribute to due diligence work in cases of acquisitions or divestments of Group entities or activities. A specific framework is in place to monitor such work and ensure there are no conflict of interest.

General Inspection and Audit define their respective workplans on a risk-based approach. Internal Audit combines this approach with the requirement to comply with a five-year audit cycle and determines the frequency of review based on the risk level of the audited entities.

In 2022, General Inspection and Internal Audit continued to perform an independent follow-up on recommendations issued by supervisors (ECB, ACPR) with regular status updates presented - in coordination with the Group's General Secretariat - to General management and the Board's Audit and Internal Control Committee.

As required by international auditing standards, IGAD is subject to an external quality assessment. IGAD's certification was maintained following a second certification by the certification institute of the IFACI (*Institut Français de l'Audit et du Contrôle Interne* – French branch of the IIA).

The context in 2022 allowed IGAD to resume business travel and on-site missions to a larger extent whilst maintaining remote auditing methods developed during the health crisis. Audit missions carried out in 2022 were split between all risk categories. Changes made to the audit plan during the year remained limited (reduction of 8% of man-days on audit missions with a total of 586 audit missions carried out this year), reflecting mainly the impact of a higher level of turnover in certain geographies and a shift in a number of projects initially planned to be subject to an audit. Such tensions also led to reschedule a few Inspection missions this year.

In 2022, IGAD initiated works required in response to recommendations issued by the European Central Bank and IFACI on the internal audit function. Such work pertained mainly to (i) governance, being IGAD's internal governance, the set-up with regards to the interactions between the internal Audit function and the Group's governance at General Management and Board of Directors' level and the governance for the audit function at local level; (ii) the redesign, to be completed by end of 2024, of its independent risk assessment exercise and (iii) the introduction of a multi-year audit plan. The implementation of these action plans will remain a priority over 2023 and 2024 for the internal audit function. In addition, the restructuring of the audit recommendations issuance and monitoring process was initiated: all Business Units and Service Units will be engaged in the process, which will enable IGAD to focus its work on the most important risks, in line with a strategic goal to optimie the layering of controls within the Group's internal control framework.

On the operational side, internal audit departments (i) further developed their ability to provide independent assurance on the performance of permanent control departments; (ii) reinforced their auditing methods on topics such as "conduct" or "ESG" and (iii) increased the use of data analytics in the audit missions.

4.3.2 CONTROL OF THE PRODUCTION AND PUBLICATION OF FINANCIAL MANAGEMENT INFORMATION

The participants involved

There are many participants in the production of financial data:

- the **Board of Directors**, and more specifically its **Audit and Internal Control Committee**, has the task of examining the draft financial statements which are to be submitted to the Board, as well as verifying the conditions under which they were prepared and ensuring not only the relevance but also the consistency of the accounting principles and methods applied. The Audit and Internal Control Committee's remit also is to monitor the independence of the Statutory Auditors, and the effectiveness of the internal control, measurement, supervision and control systems for risk related to the accounting and financial processes. The Statutory Auditors meet with the Audit and Internal Control Committee during the course of their engagement;
- the **Group Finance Department** gathers the accounting and management data compiled by the subsidiaries and the Business Units/Services Units in a set of standardised reports. It consolidates and verifies this information so that it can be used in the overall management of the Group and disclosed to third parties (supervisory bodies, investors, etc.). It also has a team in charge of the preparation of the Group regulatory reports.

  In the framework of these missions, it is in charge of:

  - monitoring the financial aspects of the Group's capital transactions and its financial structure,
  - managing its assets and liabilities, and consequently defining, managing and controlling the Group's financial position and structural risks,
  - ensuring that the regulatory financial ratios are respected,
  - defining accounting and regulatory standards, frameworks, principles and procedures for the Group, and ensuring that they are observed,
  - verifying the accuracy of all financial and accounting data published by the Group;
- the **Finance Departments of subsidiaries and Business Units/Services Units** carry out certification of the accounting data and entries booked by the back offices and of the management data submitted by the front offices. They are accountable for the financial statements and regulatory information required at the local level and submit reports (accounting data, finance control, regulatory reports, etc.) to the Group Finance Department. They can perform these activities on their own or else delegate their tasks to Shared Service Centers operating in finance and placed under Group Finance Department governance;
- the **Risk Department** consolidates the risk monitoring data from the Group's Business Units/Services Units and subsidiaries in order to control credit, market and operational risks. This information is used in Group communications to the Group's governing bodies and to third parties. Furthermore, it ensures in collaboration with the Group Finance Department, its expert role on the dimensions of credit risk, structural liquidity risks, rates, exchange rates, on the issues of recovery and resolution and the responsibility of certain closing processes, notably the production of solvency ratios;
- the **Back offices** are responsible for all support functions to front offices and ensure contractual settlements and deliveries. Among other responsibilities, they check that financial transactions are economically justified, book transactions and manage means of payment.

Accounting and regulatory standards

Local financial statements are drawn up in accordance with local accounting standards, and the consolidated Group financial statements are prepared in accordance with the standards defined by the Group Finance Department, which are based on IFRS as adopted by the European Union.

The applicable standards on solvency and liquidity, promulgated by the Basel Committee, were translated into European law by a directive (CRD4) and a regulation (CRR). They were rounded out by the Regulation CRR2 and the Directive CRD5 which entered into force on 28 June 2019. These texts are supplemented by several delegated acts and implementation technical standards. As the Societe Generale Group is identified as a "financial conglomerate", it is subjected to additional supervision.

The Group Finance Department has dedicated teams that monitor the applicable standards and draft new internal standards to comply with any changes in the accounting and regulatory framework.

Procedures for producing financial and accounting data

Each entity in the consolidation scope of the Group prepares its own accounting and management statements on a monthly basis. This information is then consolidated each month at Group level and published for the markets on a quarterly basis. Data reported are subject to analytical reviews and consistency checks performed by Finance Department or delegated to financial shared service centers acting under their responsibility and sent to the Group Finance Department. The Group Finance Department forwards the consolidated financial statements, management reports and regulatory statements to General Management and any interested third parties.

Internal control procedures governing the production of financial and accounting data

Accounting data are compiled independently of the front offices and the sales teams.

The quality and objectivity of the accounting and management data are ensured by the separation of sales functions and all the functions of operational processing and follow-up of the operations: back offices and middle offices integrated into the Resources Department and teams in charge of producing the financial reports that are housed in the Finance Department. These teams carry out a series of controls defined by Group procedures on financial and accounting data, in particular:

- verification of the economic justification of all information reported;
- reconciliation of accounting and management data, using specific procedures, respecting the specified deadlines;
- for market activities, reconciliation between the accounting result, produced by the Finance Department and the economic result, produced by a dedicated expert department in the Risk Department.

Given the increasing complexity of the Group's financial activities and organisation, staff training and IT tools are regularly upgraded to ensure that the production and verification of accounting and management data are effective and reliable.

SCOPE OF CONTROL

In practice, the internal control procedures implemented in the Group's businesses are designed to guarantee the quality of financial and accounting information, and notably to:

- ensure that the transactions entered in the Group's accounts are exhaustive and accurate;
- validate the valuation methods used for certain transactions;
- ensure that transactions are correctly assigned to the corresponding fiscal period and recorded in the accounts in accordance with the applicable accounting regulations, and that the accounting aggregates used to prepare the Group financial statements are compliant with the regulations in force;
- ensure the inclusion of all entities that must be consolidated in accordance with Group regulations;
- check that the operational risks associated with the production and transmission of accounting data through the IT system are correctly controlled, that the necessary adjustments are accurately performed, that the reconciliation of accounting and management data is satisfactory, and that the flows of cash payments and other items generated by transactions are exhaustive and adequate.

CONTROL BY THE FINANCE DEPARTMENTS

The Finance Department of each subsidiary checks the accuracy and consistency of the financial statements with respect to the relevant accounting frameworks (local standards and IFRS for subsidiaries, as well as French standards for branches). It performs checks to guarantee the accuracy of the information disclosed.

The financial data received for consolidation from each subsidiary are drawn from corporate accounting data by the subsidiaries after they have been locally brought into line with Group accounting principles.

Each subsidiary must be able to explain the transition from the Company financial statements to the financial statements reported through the consolidation tool.

The Finance Departments of the Business Units/Services Units have a dedicated department for financial management and control.

The Finance Departments also rely on shared service centers that perform Level 1 controls necessary to ensure the reliability of accounting, tax and regulatory information on the financial statements they produce in accordance with local and IFRS standards and notably data quality and consistency checks (equity, securities, foreign exchange, financial aggregates from the balance sheet and income statement, deviations from standards), justification and certification of the financial statements under their responsibility, intercompany reconciliation of the financial statements, regulatory statement checks and verification of evidence of tax charges and balances (current, deferred and duties).

These controls are declared as part of the managerial supervision and Group accounting certification processes.

These controls allow the shared services centres to provide all necessary information to the Finance Departments of Business Units/Services Units and the Group Finance and Accounting Department to ensure the reliability and consistency of the accounts prepared.

These shared service centres are located in Paris, Bangalore and Bucharest.

CONTROLS BY ALL OPERATIONAL STAFF INVOLVED IN THE PRODUCTION OF ACCOUNTING, FINANCIAL AND MANAGEMENT DATA

The operational staff monitor their activity via a permanent supervision process under the direct responsibility of their management teams, repeatedly verifying the quality of the controls carried out on completeness of accounting data and the associated accounting treatment.

SUPERVISION BY THE GROUP FINANCE DEPARTMENT

Once the financial statements prepared by the entities have been restated according to Group standards, they are entered into a central database and processed to produce the consolidated statements.

The service in charge of consolidation in the Group Accounting Department checks that the consolidation scope complies with the applicable accounting standards and performs multiple checks on data received for consolidation purposes. These checks include:

- confirmation that the data collected are properly aggregated;
- verification of recurring and non-recurring consolidation entries;
- exhaustive treatment of critical points in the consolidation process;
- treatment of any residual differences in reciprocal or intercompany statements.

Last, this service ensures that the overall consolidation process has been conducted properly by performing analytical reviews of the summary data and verifying the consistency of the main aggregates of the financial statements. These checks are complemented by cross-functional analysis such as analysis of changes in shareholders' equity, goodwill, provisions and consolidated deferred taxes.

A team in this department is in charge of managing and coordinating the Group accounting certification framework to certify first-level controls on a quarterly basis (internal control certification).

The Group Finance Department has also a dedicated team, it which is responsible for ensuring second-level permanent controls on all Finance processes and for implementing the framework within the Group. Its mission is to ensure the effectiveness, quality and relevance of the Level 1 control framework by assessing it through process or activity reviews, testing controls and quarterly certifications. The team, reporting directly to the Group Finance Department, also reports to the Head of Permanent & Internal Control Division of Societe Generale Group.

Internal audit and periodic control framework for accounting processes

Internal Audit and the General Inspection define their audits and inspections using a risk-based approach and define an annual work program (Inspection and Audit plan schedule – *plan de tournée*). As part of their assignments, teams may verify the quality of the control environment contributing to the quality of the accounting and management data produced by the audited entities. They may check a certain number of accounts and assess the reconciliations between accounting and management data, as well as the quality of the permanent supervision procedures for the production and control of accounting data. They also assess the performance of IT tools and the accuracy of manual processing.

The department in charge of auditing the Group's Central Departments is responsible for auditing the Group Finance Department. Within that department, a distinct team, placed under the responsibility of a dedicated Audit Business Correspondent, monitors and animates audit work related to accounting and financial matters on a Group-wide basis. The team provides expertise in identifying the Group's main accounting risks and develops training sessions and methodologies to help share expertise in the auditing of accounting risks.

Audit missions pertaining to accounting matters are carried out by that team, for the subjects considered as the most material for the accuracy of the Group's accounting information, as well as by Audit Departments based in the Group's entities.

Based on their findings, these teams issue recommendations to the parties involved in the production and control of accounting, financial and management data. Departments being assigned these recommendations are responsible for their implementation. A monitoring is performed by IGAD.

4.4 CAPITAL MANAGEMENT AND ADEQUACY

4.4.1 THE REGULATORY FRAMEWORK

Audited I Since January 2014, Societe Generale has applied the Basel III regulations implemented in the European Union through a regulation and a directive (CRR and CRD4 respectively).

The general framework defined by Basel III is structured around three pillars:

- Pillar 1 sets the minimum solvency, leverage and liquidity requirements and defines the rules that banks must use to measure risks and calculate the related capital requirements, according to standard or more advanced methods;
- Pillar 2 concerns the discretionary supervision implemented by the competent authority, which allows them – based on a constant dialogue with supervised credit institutions – to assess the adequacy of capital requirements as calculated under Pillar 1, and to calibrate additional capital requirements taking into account all the risks to which these institutions are exposed;
- Pillar 3 encourages market discipline by developing a set of qualitative or quantitative disclosure requirements which will allow market participants to better assess a given institution's capital, risk exposure, risk assessment processes and, accordingly, capital adequacy.

Several amendments to European regulatory standards were adopted in May 2019 (CRR2/CRD5). The majority of these provisions entered into force in June 2021.

The amendments include:

- NSFR: The text introduces the regulatory requirements for the NSFR ratio. A ratio of 100% is respected since June 2021;
- Leverage ratio: the minimum requirement of 3% to which is added, since January 2023, 50% of the buffer required as a systemic institution;
- Derivatives counterparty risk (SA-CCR): the "SA-CCR" method is the Basel method replacing the "CEM" method for determining prudential exposure to derivatives in a standard approach;
- Large Risks: the main change is the calculation of the regulatory limit (25%) on Tier 1 (instead of total own funds), as well as the introduction of a specific cross-limit on systemic institutions (15%);
- TLAC: The ratio requirement for G-SIBs is introduced in CRR. In accordance with the Basel text, G SIBs must respect an amount of own funds and eligible debt equal to the highest between 18%+risk-weighted buffers and 6.75% leverage since 2022.

With regard to the implementation of the market risk reform (FRTB), after the publication of the first revised standard in January 2016 and of the consultation in March 2018 on this subject, the Basel Committee published in January 2019 its final text: BCBS457. In March 2020, the Basel Committee announced a one-year delay in the implementation of FRTB (1 January 2023 instead of 1 January 2022 as originally planned in the January 2019 text).

The European FRTB calendar would be as follows:

- regarding reporting requirements:
  - the Standardised Approach (SA) has been effective since Q3 2021,
  - for the Internal Model Approach (IMA), for the approved banks, reporting should start three years after the publication in the Official Journal of the European Union (OJEU) of three technical standards (RTS) of the EBA, which entered in force on the 15th of November 2022;
- capital requirements for FRTB: Expected by 1 January 2025 at this stage, which would make the IMA reporting obsolete; a 2-year delay (i.e. 1 January 2027) could be applied in the event of unlevel playing field with other major jurisdictions In December 2017, the Group of Central Bank Governors and Heads of Supervision (GHOS), the Basel Committee's oversight body, endorsed the regulatory reforms aiming to complete Basel 3.

In December 2017, the Group of Central Bank Governors and Heads of Supervision (GHOS), the Basel Committee's oversight body, endorsed the regulatory reforms aiming to complete Basel 3.

A first version of the transposition text was published by the European Commission on 27 October 2021 ("CRR3 – CRD6") and will serve as support for the European Trialogue where this version will be combined with the Council text published in November 2022 and the Parliament text. The trialogue is expected to be finalized in the summer of 2023. It will then have to be voted by Parliament to become applicable. .

These new rules, which were to take effect from 2022, have been postponed to January 2025 with an overall output floor: the risk-weighted assets (RWA) will be floored to a percentage of the standard method (credit, market and operational). The output floor level will increase gradually, from 50% in 2025 to 72.5% in 2030.▲

4.4.2 CAPITAL MANAGEMENT

Audited I As part of its capital management, the Group (under the managment of the Finance Department and the supervision of Risk Department) ensures that its solvency level is always compatible with the following objectives:

- maintaining its financial strength and respecting the risk appetite;
- preserving its financial flexibility to finance organic growth and growth through acquisitions;
- allocating adequate capital to the various businesses, according to the Group's strategic objectives;
- maintaining the Group's resilience in the event of stress scenarios;
- meeting the expectations of its various stakeholders: supervisors, debt and equity investors, rating agencies, and shareholders.

The Group determines its internal solvency targets in accordance with these objectives and regulatory thresholds.

The Group has an internal process for assessing the adequacy of its capital that measures and explains the evolution of the Group's capital ratios over time, taking into account any future regulatory constraints and changes in the scope. ▲

This process is based on a selection of key metrics that are relevant to the Group in terms of risk and capital measurement, such as CET1, Tier 1 and Total Capital ratios. These regulatory indicators are supplemented by an assessment of the coverage of internal capital needs by available CET1 capital and an economic perspective, thus confirming the relevance of the targets set in the risk appetite. Besides, this assessment takes into account the constraints arising from the other metrics of the risk appetite, such as rating, MREL and TLAC or leverage ratio.

All of these indicators are measured on a forward-looking basis in relation to their target on a quarterly or even monthly basis for the current year. During the preparation of the financial plan, they are also assessed on an annual basis over a minimum of three-year horizon according to at least a baseline and adverse scenarios, in order to demonstrate the resilience of the bank's business model against adverse macroeconomic and financial uncertain environments. Capital adequacy is continuously monitored by the Executive Management and by the Board of Directors as part of the Group's corporate governance process and is reviewed in depth during the preparation of the financial plan. It ensures that the bank always complies with its financial target and that its capital level is above the "Maximum Distributable Amount" (MDA) threshold.

Besides, the Group maintains a balanced capital allocation among its three strategic core businesses:

- French Retail Banking;
- International Retail Banking and Financial Services;
- Global Banking and Investor Solutions.

Each of the Group's core businesses accounts for around a third of total Risk-Weighted Assets (RWA), with a predominance of credit risk (83% of total Group RWA, including counterparty credit risk).

At 31 December 2022, Group RWA were down 1% to EUR 360 billion, compared with EUR 363 billion at end-December 2021.

The trend traced by the business lines' RWA lies at the core of the operational management of the Group's capital trajectory based on a detailed understanding of the vectors of variations. Where appropriate, the General Management may decide, upon a proposal from the Finance Department, to implement managerial actions to increase or reduce the share of the business lines, for instance by validating the execution of synthetic securitisation or of disposals of performing or non-performing portfolios. The Group Capital Committee and the capital contingency plan provide General Management with framework analysis, governance and several levers in order to adjust the capital management trajectory.

4.4.3 SCOPE OF APPLICATION – PRUDENTIAL SCOPE

The Group's prudential reporting scope includes all fully consolidated entities, with the exception of insurance entities, which are subject to separate capital supervision.

All regulated entities of the Group comply with their prudential commitments on an individual basis.

Non-regulated entities outside of the scope of prudential consolidation are subject to periodic reviews, at least annually.

The following table provides the main differences between the accounting scope (consolidated Group) and the prudential scope (Banking Regulation requirements).

TABLE 2: DIFFERENCE BETWEEN ACCOUNTING SCOPE AND PRUDENTIAL REPORTING SCOPE

Type of entity	Accounting treatment	Prudential treatment
Entities with a finance activity	Full consolidation	Full consolidation
Entities with an Insurance activity	Full consolidation	Equity method
Holdings with a finance activity by nature	Equity method	Equity method
Joint ventures with a finance activity by nature	Equity method	Proportional consolidation

The following table provides a reconciliation between the consolidated balance sheet and the accounting balance sheet within the prudential scope.The amounts presented are accounting data, not a measure of RWA, EAD or prudential capital. Prudential filters related to entities and holdings not associated with an insurance activity are grouped together on account of their non-material weight (< 0.1%).

TABLE 3: RECONCILIATION OF REGULATORY OWN FUNDS TO BALANCE SHEET IN THE AUDITED FINANCIAL STATEMENTS

ASSETS at 31.12.2022 *(In EURm)*	**Balance sheet as in published financial statements**	**Prudential restatements linked to insurance**[(1)]	**Prudential restatements linked to consolidation methods**	**Balance sheet under regulatory scope of consolidation**	**Reference to table 14 (CC1)**
Cash, due from banks	207,013	(0)	0	207,012	
Financial assets at fair value through profit or loss	329,437	11,135	(0)	340,571	
Hedging derivatives	32,850	10	-	32,860	
Financial assets at fair value through other comprehensive income	37,463	(0)	-	37,463	
Securities at amortised cost	21,430	(0)	-	21,430	
Due from banks at amortised cost	66,903	1	51	66,955	1
o.w. subordinated loans to credit institutions	*238*	*(0)*	-	*238*	
Customer loans at amortised cost	506,529	1,524	(11)	508,041	
Revaluation differences on portfilios hedged against interest rate risk	(2,262)	-	-	(2,262)	
Investment of insurance activities	158,415	(158,415)	-	-	
Tax assets	4,697	(406)	0	4,292	
o.w. deferred tax assets that rely on future profitability excluding those arising from temporary differences	*1,662*	-	*(594)*	*1,069*	*2*
o.w. deferred tax assets arising from temporary differences	*2,215*	-	*325*	*2,540*	
Other assets	86,247	(4,003)	155	82,399	
o.w. defined-benefit pension fund assets	*47*	-	-	47	*3*
Non-current assets held for sale	1,081	-	-	1,081	
Investments accounted for using the equity method	146	3,438	(42)	3,541	
Tangible and intangible assets	33,089	(64)	0	33,025	
o.w. intangible assets exclusive of leasing rights	*2,881*	-	(41)	2,840	*4*
Goodwill	3,781	(325)	-	3,456	4
TOTAL ASSETS	**1,486,818**	**(147,106)**	**152**	**1,339,864**	

(1) Restatement of entities excluded from the prudential scope and reconsolidation of intra-group transactions relating to these entities.

LIABILITIES at 31.12.2022 *(In EURm)*	**Balance sheet as in published financial statements**	**Prudential restatements linked to insurance**[(1)]	**Prudential restatements linked to consolidation methods**	**Balance sheet under regulatory scope of consolidation**	**Reference to table 14 (CC1)**
Due to central banks	8,361	-	-	8,361	
Financial liabilities at fair value through profit or loss	300,618	2,473	-	303,091	
Hedging derivatives	46,164	19	-	46,183	
Debt securities issued	133,176	336	-	133,512	
Due to banks	132,988	(2,187)	19	130,820	
Customer deposits	530,764	913	(123)	531,553	
Revaluation differences on portfolios hedged against interest rate risk	(9,659)	-	-	(9,659)	
Tax liabilities	1,637	(168)	0	1,470	
Other Liabilities	107,552	(5,766)	256	102,042	
Non-current liabilities held for sale	220	-	-	220	
Liabilities related to insurance activities contracts	141,688	(141,688)	-	-	
Provisions	4,579	(21)	-	4,558	
Subordinated debts	15,946	40	-	15,986	
o.w. redeemable subordinated notes including revaluation differences on hedging items	*15,521*	*42*	-	*15,563*	*5*
TOTAL DEBTS	**1,414,036**	**(146,049)**	**152**	**1,268,139**	
Subtotal Equity, Group share	66,451	(202)	(0)	66,249	6
Issued common stocks, equity instruments and capital reserves	*30,384*	*1*	-	*30,384*	
Retained earnings	*34,267*	*(203)*	*(0)*	*34,065*	
Net income	*2,018*	*(0)*	-	*2,018*	
Unrealised or deferred capital gains and losses	*(218)*	*0*	*(0)*	*(218)*	
Minority interests	6,331	(855)	-	5,476	7
TOTAL EQUITY	**72,782**	**(1,057)**	**(0)**	**71,725**	
TOTAL LIABILITIES	**1,486,818**	**(147,106)**	**152**	**1,339,864**	

(1) Restatement of entities excluded from the prudential scope and reconsolidation of intra-group transactions relating to these entities.

ASSETS at 31.12.2021 *(In EURm)*	**Balance sheet as in published financial statements**	**Prudential restatements linked to insurance[1]**	**Prudential restatements linked to consolidation methods**	**Balance sheet under regulatory scope of consolidation**	**Reference to table 14 (CC1)**
Cash, due from banks	179,969	(0)	0	179,969	
Financial assets at fair value through profit or loss	342,714	11,128	(0)	353,842	
Hedging derivatives	13,239	30	-	13,269	
Financial assets at fair value through other comprehensive income	43,450	(0)	-	43,450	
Securities at amortised cost	19,371	(0)	-	19,371	
Due from banks at amortised cost	55,972	(0)	90	56,062	1
o.w. subordinated loans to credit institutions	*99*	*(0)*	*-*	*99*	
Customer loans at amortised cost	497,164	1,575	(6)	498,733	
Revaluation differences on portfilios hedged against interest rate risk	131	-	-	131	
Investment of insurance activities	178,898	(178,898)	-	-	
Tax assets	4,812	(195)	0	4,617	
o.w. deferred tax assets that rely on future profitability excluding those arising from temporary differences	*1,719*	*-*	*(622)*	*1,096*	*2*
o.w. deferred tax assets arising from temporary differences	*2,111*	*-*	*378*	*2,489*	
Other assets	92,898	(2,654)	114	90,357	
o.w. defined-benefit pension fund assets	*85*	*-*	*-*	*85*	*3*
Non-current assets held for sale	27	-	-	27	
Investments accounted for using the equity method	95	4,629	(76)	4,649	
Tangible and intangible assets	31,968	(163)	0	31,805	
o.w. intangible assets exclusive of leasing rights	*2,733*	*-*	*(134)*	*2,599*	*4*
Goodwill	3,741	(325)	-	3,416	4
TOTAL ASSETS	**1,464,449**	**(164,873)**	**121**	**1,299,698**	

(1) Restatement of entities excluded from the prudential scope and reconsolidation of intra-group transactions relating to these entities.

LIABILITIES at 31.12.2021 *(In EURm)*	**Balance sheet as in published financial statements**	**Prudential restatements linked to insurance[1]**	**Prudential restatements linked to consolidation methods**	**Balance sheet under regulatory scope of consolidation**	**Reference to table 14 (CC1)**
Due to central banks	5,152	-	-	5,152	
Financial liabilities at fair value through profit or loss	307,563	1,854	-	309,418	
Hedging derivatives	10,425	4	-	10,429	
Debt securities issued	135,324	432	-	135,757	
Due to banks	139,177	(2,574)	49	136,652	
Customer deposits	509,133	1,002	(121)	510,013	
Revaluation differences on portfolios hedged against interest rate risk	2,832	-	-	2,832	
Tax liabilities	1,577	(299)	0	1,279	
Other Liabilities	106,305	(8,962)	193	97,536	
Non-current liabilities held for sale	1	-	-	1	
Liabilities related to insurance activities contracts	155,288	(155,288)	-	-	
Provisions	4,850	(23)	-	4,827	
Subordinated debts	15,959	40	-	15,999	
o.w. redeemable subordinated notes including revaluation differences on hedging items	*15,519*	*42*	*-*	*15,561*	*5*
TOTAL DEBTS	**1,393,586**	**(163,813)**	**122**	**1,229,894**	
Subtotal Equity, Group share	65,067	(202)	(0)	64,865	6
Issued common stocks, equity instruments and capital reserves	*29,447*	*1*	*-*	*29,448*	
Retained earnings	*30,631*	*(203)*	*(0)*	*30,428*	
Net income	*5,641*	*0*	*-*	*5,641*	
Unrealised or deferred capital gains and losses	*(652)*	*0*	*(0)*	*(653)*	
Minority interests	5,796	(858)	-	4,939	7
TOTAL EQUITY	**70,863**	**(1,060)**	**(0)**	**69,804**	
TOTAL LIABILITIES	**1,464,449**	**(164,873)**	**121**	**1,299,698**	

(1) Restatement of entities excluded from the prudential scope and reconsolidation of intra-group transactions relating to these entities.

The main Group companies outside the prudential reporting scope are as follows:

TABLE 4: ENTITIES OUTSIDE THE PRUDENTIAL SCOPE

Company	Activity	Country
Antarius	Insurance	France
ALD RE Designated Activity Company	Insurance	Ireland
Catalyst RE International LTD	Insurance	Bermuda
Sogelife	Insurance	Luxembourg
Sogecap	Insurance	France
Komercni Pojstovna A.S.	Insurance	Czech Republic
La Marocaine Vie	Insurance	Morocco
Oradea Vie	Insurance	France
SGL RE	Insurance	Luxembourg
Société Générale RE SA	Insurance	Luxembourg
Sogessur	Insurance	France
Banque Pouyanne	Bank	France

All regulated Group undertakings are generally subject to solvency requirements set by their respective supervisory authorities. Regulated financial entities and affiliates outside of Societe Generale's prudential consolidation scope all comply with their respective solvency requirements. As a general principle, all banks should be under a double supervision, on a standalone basis and on a consolidated basis, but the CRR allows, under specific conditions, waivers from the requirements on an individual basis granted by the competent authorities.

The supervisory authority accepted that some Group entities may be exempted from the application of prudential requirements on an individual basis or, where applicable, on a sub-consolidated basis. Terms and conditions of waiver of requirements granted by supervisors include a commitment to provide these subsidiaries with the Group's support to ensure their overall solvency and liquidity, as well as a commitment to ensure that they are managed prudently according to the applicable banking regulations.

The conditions for applying waivers regarding monitoring on an individual basis for a parent company, as far as solvency and large exposure ratios are concerned, are defined by the CRR, which stipulates that two conditions have to be met:

- there is no significant obstacle, in law or in fact, current or anticipated, to the prompt transfer of equity capital or the rapid repayment of liabilities to the parent company in a member state;
- the risk assessment, measurement and control procedures that are useful for the purposes of supervision on a consolidated basis cover the Parent Institution in a Member State.

Accordingly, for instance, Societe Generale SA is not subject to prudential requirements on an individual basis.

Any transfer of equity or repayment of liabilities between the parent company and its entities is carried out in compliance with capital and liquidity requirements that are locally applicable. The obligation to comply with such requirements may affect the capacity of subsidiaries to transfer funds to the parent company. Every year, in compliance with local capital and liquidity regulatory requirements, the Group reviews the capitalization of its subsidiaries (direct and indirect) and proposals for appropriation of their allocating their net income (payment of dividends, retained earnings, etc.). In addition, the Group studies requests from its subsidiaries relating to changes in their equity or eligible liabilities (capital increases or decrease, distributions of exceptional dividends, loan issues or repayments). These reviews and studies show that, as long as subsidiaries comply with their regulatory constraints, there is no significant obstacle to transfer funds from Societe Generale to them or vice versa.

The financing process of subsidiaries within the Group allows rapid repayments of loans between the parent company and its subsidiaries. In 2022, the embargo on Russia was a significant obstacle to the rapid repatriation of the funds generated by the sale of Rosbank, which could finally be repatriated. Moreover, the war in Ukraine is disrupting remittances, but the Group is not significantly affected.

4.4.4 REGULATORY CAPITAL

Reported in accordance with International Financial Reporting Standards (IFRS), Societe Generale's regulatory capital consists of the following components:

Common Equity Tier 1 capital

According to the applicable regulations, Common Equity Tier 1 capital is made up primarily of the following:

- ordinary shares (net of repurchased shares and treasury shares) and related share premium accounts;
- retained earnings;
- components of other comprehensive income;
- other reserves;
- minority interests limited by CRR/CRD.

Deductions from Common Equity Tier 1 capital essentially involve the following:

- estimated dividend payments;
- goodwill and intangible assets, net of associated deferred tax liabilities;
- unrealised capital gains and losses on cash flow hedging;
- income on own credit risk;
- deferred tax assets on tax loss carryforwards;
- deferred tax assets resulting from temporary differences beyond a threshold;
- assets from defined benefit pension funds, net of deferred taxes;
- any positive difference between expected losses on customer loans and receivables managed under the internal ratings-based (IRB) approach, and the sum of related value adjustments and collective impairment losses;
- expected losses on equity portfolio exposures;
- value adjustments resulting from the requirements of prudent valuation;
- securitisation exposures weighted at 1,250%, when these positions are excluded from the calculation of RWA.

Additional Tier 1 capital

According to CRR/CRD regulations, Additional Tier 1 capital is made up of deeply subordinated notes that are issued directly by the Bank, and have the following features:

- these instruments are perpetual and constitute unsecured, deeply subordinated obligations. They rank junior to all other obligations of the Bank, including undated and dated subordinated debt, and senior only to common stock shareholders;
- Societe Generale may elect, on a discretionary basis, not to pay the interest and coupons linked to these instruments. This compensation is paid out of distributable items;
- they include neither a step-up in compensation nor any other incentive to redeem;
- they must have a loss-absorbing capacity;
- they might be haircut or converted when in resolution or independently of a resolution measurement;
- subject to the prior approval of the European Central Bank, Societe Generale has the option to redeem these instruments at certain dates, but no earlier than five years after their issuance date.

Deductions of Additional Tier 1 capital essentially apply to the following:

- AT1 treasury shares;
- holding of AT1 hybrid shares issued by financial sector entities;
- minority interests beyond the minimum T1 requirement in the entities concerned.

Tier 2 capital

Tier 2 capital includes:

- subordinated notes;
- any positive difference between the sum of value adjustments and impairment losses on customer loans and receivables exposures managed under the IRB approach and expected losses, up to 0.6% of total credit RWA under the IRB approach;
- value adjustments for credit risk related to collective impairment losses on customer loans and receivables exposures managed under the standardised approach, up to 1.25% of total credit RWA.

Deductions of Tier 2 capital essentially apply to the following:

- Tier 2 hybrid treasury shares;
- holding of Tier 2 hybrid shares issued by financial sector entities;
- minority interests beyond the minimum capital requirement in the entities concerned.

All capital instruments and their features are detailed online (*www.societegenerale.com/en/measuring-our-performance/information-and-publications/registration-documents*).

TABLE 5: CHANGES IN DEBT INSTRUMENTS ELIGIBLE FOR SOLVENCY CAPITAL REQUIREMENTS

(In EURm)	31.12.2021	Issues	Redemptions	Prudential supervision valuation haircut	Others	31.12.2022
Debt instruments eligible for Tier 1	8,003	1,546	-	-	468	10,017
Debt instruments eligible for Tier 2	11,820	2,450	(157)	(1,815)	251	12,549
TOTAL ELIGIBLE DEBT INSTRUMENTS	**19,823**	**3,996**	**(157)**	**(1,815)**	**719**	**22,566**

Solvency ratios

The solvency ratios are set by comparing the Group's equity (Common Equity Tier 1 (CET1), Tier 1 (T1) or Total Capital (TC)) with the sum of risk-weighted exposures for credit risk and the capital requirement multiplied by 12.5 for market and operational risks.

Each quarter, the ratios are calculated following the accounting closing and then compared to the supervisory requirements.

The Pillar 1 regulatory minimum capital requirement is set at 4.5% for CET1, 6% for T1 and 8% for TC. This minimum remains stable over time.

The minimum Pillar 2 requirement (P2R) is set by the supervisor following the Supervisory Review and Evaluation Process (SREP). It has been standing at 2.12% until 31 December 2022, this level will stand at 2.14% including the additional requirement regarding Pillar 2 prudential expectations on the provisioning of non-performing loans granted before 26 April 2019.

In addition to these requirements comes the overall buffer requirement which is the sum of:

- the mean of the countercyclical buffer rates of each country, weighted by the relevant credit risk exposures in these countries. As of 1 January 2023, Societe Generale's countercyclical buffer is equal to 0.19%;
- the conservation buffer in force since 1 January 2016 with a maximum level standing at 2.50% since 1 January 2019;
- the Group's G-SIB buffer imposed by the Financial Stability Board (FSB), which is equal to 1%.

As at 31 December 2022, taking into account the combined regulatory buffers, the phased-in CET1 ratio level that would trigger the Maximum Distributable Amount (MDA) mechanism stands at 9.35%. It will stand at 9.39% from 1 January 2023.

TABLE 6: BREAKDOWN OF PRUDENTIAL CAPITAL REQUIREMENT FOR SOCIETE GENERALE

	31.12.2022	01.03.2022	01.01.2022
Minimum requirement for Pillar 1	4.50%	4.50%	4.50%
Minimum requirement for Pillar 2 (P2R)(1)	1.19%	1.19%	0.98%
Minimum requirement for countercyclical buffer	0.16%	0.04%	0.04%
Minimum requirement for conservation buffer	2.50%	2.50%	2.50%
Minimum requirement for systemic buffer	1.00%	1.00%	1.00%
Minimum requirement for CET1 ratio	**9.35%**	**9.23%**	**9.02%**

(1) According to Article 104 bis of the CRDV Directive, banks must now meet a minimum of 56% P2R with CET1 capital (as opposed to 100% previously) and 75% with Tier 1 capital.

TABLE 7: REGULATORY CAPITAL AND SOLVENCY RATIOS[1]

(In EURm)	31.12.2022	31.12.2021
Shareholders' equity (IFRS), Group share	**66,451**	**65,067**
Deeply subordinated notes	(10,017)	(8,003)
Perpetual subordinated notes	(0)	(0)
Group consolidated shareholders' equity net of deeply subordinated and perpetual subordinated notes	**56,434**	**57,064**
Non-controlling interests	5,207	4,762
Intangible assets	(2,161)	(1,828)
Goodwill	(3,478)	(3,408)
Dividends proposed (to the General Meeting) and interest expenses on deeply subordinated and perpetual subordinated notes	(1,879)	(2,345)
Deductions and regulatory adjustments	(5,484)	(4,410)
COMMON EQUITY TIER 1 CAPITAL	**48,639**	**49,835**
Deeply subordinated notes and preferred shares	10,017	8,003
Other additional Tier 1 capital	209	206
Additional Tier 1 deductions	(138)	(137)
TOTAL TIER 1 CAPITAL	**58,727**	**57,907**
Tier 2 instruments	12,549	11,820
Other Tier 2 capital	238	287
Tier 2 deductions	(1,790)	(1,527)
Total regulatory capital	**69,724**	**68,487**
TOTAL RISK-WEIGHTED ASSETS	**360,464**	**363,371**
Credit and counterparty credit risk-weighted assets	300,694	304,922
Market risk-weighted assets	13,747	11,643
Operational risk-weighted assets	46,023	46,806
Solvency ratios		
Common Equity Tier 1 ratio	13.49%	13.71%
Tier 1 ratio	16.29%	15.94%
Total capital ratio	19.34%	18.85%

(1) Ratios set in accordance with CRR2/CRD5 rules as published in June 2019, including Danish compromise for insurance, and taking into account the IFRS 9 phasing (fully-loaded CET1 ratio of 13.34% at 31 December 2022, the phasing effect being +17 bps) and the effects of the ECB's Covid-19 transitional measures ending on 31 December 2022.

The solvency ratio as at 31 December 2022 stood at 13.5% in Common Equity Tier 1 (13.7% at 31 December 2021) and 16.3% in Tier 1 (15.9% at 31 December 2021) for a total ratio of 19.3% (18.8% at 31 December 2021).

Group shareholders' equity at 31 December 2022 totalled EUR 66.4 billion (compared with EUR 65.1 billion at 31 December 2021).

After taking into account non-controlling interests and regulatory adjustments, CET1 regulatory capital was EUR 48.6 billion at 31 December 2022, *vs.* EUR 49.8 billion at 31 December 2021. The Additional Tier One deductions mainly regard authorisations to buy back own Additional Tier 1 capital instruments as well as subordinated bank and insurance loans.

TABLE 8: CET1 REGULATORY DEDUCTIONS AND ADJUSTMENTS

(In EURm)	31.12.2022	31.12.2021
Unrecognised minority interests	(3,326)	(2,860)
Deferred tax assets	(1,068)	(1,096)
Prudent Valuation Adjustment	(852)	(911)
Adjustments related to changes in the value of own liabilities	(245)	254
Other	7	203
TOTAL CET1 REGULATORY DEDUCTIONS AND ADJUSTMENTS	**(5,484)**	**(4,410)**

The prudential deductions and restatements included in the “Other” category essentially involve the following:

- any positive difference between expected losses on customer loans and receivables managed under the internal ratings-based (IRB) approach, and the sum of related value adjustments and impairment losses;
- expected losses on equity portfolio exposures;
- unrealised gains and losses on cash flow hedges;
- assets from defined benefit pension funds, net of deferred taxes;
- securitisation exposures weighted at 1,250%, when these positions are excluded from the calculation of RWA.

4.4.5 RISK-WEIGHTED ASSETS AND CAPITAL REQUIREMENTS

The Basel III Accord has established the rules for calculating minimum capital requirements in order to more accurately assess the risks to which banks are exposed, taking into account the risk profile of transactions *via* two approaches intended for determining RWA: a standardised approach and an advanced one based on internal methods modelling the counterparties’ risk profiles.

Change in risk-weighted assets and capital requirements

TABLE 9: OVERVIEW OF RISK-WEIGHTED ASSETS

	Risk-weighted assets			Total own funds requirements
(In EURm)	**31.12.2022**	**30.09.2022**	**31.12.2021**	**31.12.2022**
Credit risk (excluding counterparty credit risk)	**269,084**	**271,963**	**271,012**	**21,527**
o.w. standardised approach	*94,083*	*95,360*	*103,323*	*7,527*
o.w. Foundation IRB (FIRB) approach	*4,190*	*4,213*	*4,121*	*335*
o.w. slotting approach	*667*	*720*	*752*	*53*
o.w. equities under the simple risk-weighted approach	*2,753*	*3,404*	*3,515*	*220*
o.w. other equities under IRB approach	*13,864*	*14,716*	*18,189*	*1,109*
o.w. Advanced IRB (AIRB) approach	*153,528*	*153,551*	*141,111*	*12,282*
Counterparty credit risk – CCR	**23,803**	**31,160**	**27,478**	**1,904**
o.w. standardised approach(1)	*6,649*	*8,102*	*9,304*	*532*
o.w. internal model method (IMM)	*12,381*	*17,145*	*13,088*	*990*
o.w. exposures to a CCP	*918*	*1,084*	*1,273*	*73*
o.w. credit valuation adjustment – CVA	*2,805*	*3,521*	*2,807*	*224*
o.w. other CCR	*1,050*	*1,308*	*1,007*	*84*
Settlement risk	**6**	**12**	**63**	**1**
Securitisation exposures in the non-trading book (after the cap)	**7,801**	**7,562**	**6,368**	**624**
o.w. SEC-IRBA approach	*2,706*	*2,764*	*2,082*	*216*
o.w. SEC-ERBA incL IAA	*4,023*	*3,881*	*3,978*	*322*
o.w. SEC-SA approach	*1,072*	*916*	*308*	*86*
o.w. 1,250%/deductions	-	-	-	-
Position, foreign exchange and commodities risks (Market risk)	**13,747**	**15,324**	**11,643**	**1,100**
o.w. standardised approach	*1,932*	*2,528*	*1,419*	*155*
o.w. IMA	*11,816*	*12,796*	*10,225*	*945*
Large exposures	-	-	-	-
Operational risk	**46,023**	**45,626**	**46,806**	**3,682**
o.w. basic indicator approach	-	-	-	-
o.w. standardised approach	*1,290*	*1,232*	*2,412*	*103*
o.w. advanced measurement approach	*44,733*	*44,394*	*44,394*	*3,579*
Amounts (included in the “credit risk” section above) below the thresholds for deduction (subject to 250% risk weight)	7,319	7,835	7,344	586
TOTAL	**360,465**	**371,645**	**363,371**	**28,837**

(1) The amounts of RWA at 31 December 2021 and at 30 September 2021 correspond to the new SA-CCR approach following the application of Regulation (EU) No. 2019/876 (CRR2).

TABLE 10: RISK-WEIGHTED ASSETS (RWA) BY CORE BUSINESS AND RISK TYPE

(In EURbn)	Credit and counterparty credit	Market	Operational	Total 31.12.2022	Total 31.12.2021
French Retail Banking	101.0	0.0	5.1	106.1	95.5
International Retail Banking and Financial Services	105.6	0.2	4.6	110.4	117.7
Global Banking and Investor Solutions	82.1	12.6	29.0	123.7	131.2
Corporate Centre	12.1	0.9	7.4	20.3	19.0
Group	**300.7**	**13.7**	**46.0**	**360.5**	**363.4**

As at 31 December 2022, RWA (EUR 360.5 billion) were distributed as follows:

- credit and counterparty credit risks accounted for 83% of RWA (of which 35% for International Retail Banking and Financial Services);
- market risk accounted for 4% of RWA (of which 92% for Global Banking and Investor Solutions);
- operational risk accounted for 13% of RWA (of which 63% for Global Banking and Investor Solutions).

4.4.6 TLAC AND MREL RATIOS

The Total Loss Absorbing Capacity (TLAC) requirement which applies to Societe Generale is 18 % of RWA since 1 January 2022, to which the conservation buffer of 2.5%, the G-SIB buffer of 1% and the countercyclical buffer must be added. As at 31 December 2022, the global TLAC requirement thus stood at 21.66% of Group RWA.

The TLAC rule also provides for a minimum ratio of 6.75% of the leverage exposure January 2022.

As at 31 December 2022, Societe Generale reached a phased-in TLAC ratio of 30.5% excluding senior preferred debts. The phased-in ratio stands at 33.6% of RWA when considering the possibility to account for senior preferred debts up to 3.5% of RWA and 9% of leverage exposure.

The Minimum Requirement for own funds and Eligible Liabilities (MREL) has applied to credit institutions and investment firms within the European Union since 2016.

Contrary to the TLAC ratio, the MREL is tailored to each institution and regularly revised by the resolution authority.

Throughout 2022, Societe Generale complied with its MREL requirement.

4.4.7 LEVERAGE RATIO

The Group calculates its leverage ratio according to the CRR2 rules applicable since June 2021.

Managing the leverage ratio means both calibrating the amount of Tier 1 capital (the numerator of the ratio) and controlling the Group's leverage exposure (the denominator of the ratio) to achieve the target ratio levels that the Group sets for itself. To this end, the leverage exposure of the different businesses is monitored by the Finance Division.

The Group aims to maintain a consolidated leverage ratio that is significantly higher than the 3.5% minimum set in the Basel Committee's recommendations, implemented in Europe via CRR2, including a fraction of the systemic buffer which is applicable to the Group.

At 31 December 2022, the leverage ratio of Societe Generale stood at 4.37% taking into account a Tier 1 capital amount of EUR 58.7 billion compared with a leverage exposure of EUR 1,345 billion (versus 4.87% at 31 December 2021, with EUR 57.9 billion and EUR 1,190 billion, respectively).

TABLE 11: LEVERAGE RATIO SUMMARY AND TRANSITION FROM PRUDENTIAL BALANCE SHEET TO LEVERAGE EXPOSURE[1]

(In EURm)	31.12.2022	31.12.2021
Tier 1 capital[2]	**58,727**	**57,907**
Total assets in prudential balance sheet[3]	**1,339,864**	**1,299,698**
Adjustments for derivative financial instruments	(7,197)	8,619
Adjustments for securities financing transactions[4]	15,156	14,896
Off-balance sheet exposure (loan and guarantee commitments)	123,022	118,263
Technical and prudential adjustments	(125,976)	(252,223)
o.w. central banks' exemption [5]	-	*(117,664)*
Leverage ratio exposure	**1,344,870**	**1,189,253**
Leverage ratio	**4.37%**	**4.87%**

(1) Ratio set in accordance with CRR2 rules and taking into account the IFRS 9 phasing (leverage ratio of 4.32% without phasing at 31 December 2022, the phasing effect being -5 bps).
(2) The capital overview is available in Table 3.
(3) The prudential balance sheet corresponds to the IFRS balance sheet less entities accounted for through the equity method (mainly insurance subsidiaries).
(4) Securities financing transactions: repurchase transactions, securities lending or borrowing transactions and other similar transactions.
(5) Change in the starting period.

4.4.8 RATIO OF LARGE EXPOSURES

The CRR incorporates the provisions regulating large exposures. As such, Societe Generale must not have any exposure towards a single beneficiary which exceeds 25% of the Group's capital.

The final rules of the Basel Committee on large exposures, transposed in Europe *via* CRR2, have been applicable since June 2021. The main changes compared with CRR reside in the calculation of the regulatory limit (25%), henceforth expressed as a proportion of Tier 1 (instead of cumulated Tier 1 and Tier 2), and in the introduction of a cross-specific limit on systemic institutions (15%).

4.4.9 FINANCIAL CONGLOMERATE RATIO

The Societe Generale Group, also identified as a "Financial conglomerate", is subject to additional supervision from the ECB.

At 31 December 2022, Societe Generale's financial conglomerate equity covered the solvency requirements for both banking and insurance activities.

At 30 June 2022, the financial conglomerate ratio was 140%, consisting of a numerator "Own funds of the Financial Conglomerate" of EUR 74.1billion, and a denominator "Regulatory requirement of the Financial Conglomerate" of EUR 52.9 billion.

As at 31 December 2021, the financial conglomerate ratio was 150%, consisting of a numerator "Own funds of the Financial Conglomerate"of EUR 76.1 billion, and a denominator "Regulatory requirement of the Financial Conglomerate" of EUR 50.9 billion.

4.5 CREDIT RISK

Audited I Credit risk corresponds to the risk of losses arising from the inability of the Group's customers, issuers or other counterparties to meet their financial commitments. This risk includes the risk related to securitisation activities, and may be further amplified by individual, country and sector concentration risk. It also concerns the risk linked to syndication activity. It also includes underwriting risk which is the risk of loss arising from debt syndication activities where the bank fails to meet its final take target due to market conditions, inaccurate reading of investor demand, miscalculated credit profile of the borrower or credit deterioration of the borrower during the syndication phase of the loan/the bond. ▲

4.5.1 CREDIT RISK MONITORING AND SURVEILLANCE SYSTEM

General principles

Audited I The risk approval process is based on the following main principles:

- the analysis and the validation of the files fall respectively and independently to the sector of commercial follow-up of the client and to the dedicated risk units within the risk management function. In order to guarantee a consistent approach to Group risk-taking, this commercial monitoring sector and this risk unit examine all authorisation requests relating to a given client or category of clients. This commercial monitoring sector and this risk unit must be independent of each other;
- the internal rating of counterparties is a key criterion in the granting policy. These ratings are proposed by the commercial monitoring sector and validated by the dedicated risk unit;
- a system of delegation of competence, largely based on the internal rating of the counterparties, confers decision-making capacities to the risk units on the one hand and the commercial monitoring sectors on the other.

The business line assumes the burden of provisions and losses related to its credit decisions as the first line of defence. The Risk Department submits recommendations to CORISQ on the evolution of the granting policy, with limits on credit portfolios, for the countries, geographic areas, sectors, products or types of customers presenting high concentration risks. ▲

Governance

The main mission of the Risk Department is to draw up the document formalising and defining with the Finance Department the Group's risk appetite, a mechanism aimed at defining the acceptable level of risk given the Group's strategic objectives.

The Risk Department is responsible for implementing the system to manage and monitor risks, including cross-Group risks. The Risk Department exercises hierarchical and functional oversight of the Risk management function in charge of Group credit risk giving it a comprehensive view of all the Group's credit risks.

The Risk Department helps define risk policies in light of each core business targets and the associated risk issues. It defines or approves the methods and procedures used to analyse, measure, approve and monitor risks and the risk IT system and makes sure these are appropriate to the core businesses' needs. As second line of defence, various Risk Departments (for Retail Banking, Corporate and Investment Banking and Market activities) are also in charge of credit risk and as such responsible for the independent control as second line of defence. These consist in independently reviewing and comparing any credit application that exceeds the authority delegated to core businesses or local Risk Department teams. The Risk Department also assesses the quality of first-level credit reviews and takes any remedial action necessary.

The Risk Department also approves transactions and limits proposed by core business lines in respect of credit risk.

Finally, as part of its responsibilities as a second line of defence, the Risk Department carries out permanent controls of credit risks. As such, the Risk Department provides independent control as a second line of defence on the detection and monitoring of the overshoot resolution.

The monthly Risk Monitoring Report presented to CORISQ by the Risk Department comments among others on the evolution of the Group's credit portfolio and ensures compliance with the guidelines. Changes in the credit portfolio, changes in credit policy validated by CORISQ and respect for the Group's risk appetite are presented at least quarterly to the Risk Committee of the Board of Directors.

As part of the quarterly reporting to the Board of Directors and to the Risk Committee of the Board of Directors, an overview of the main credit risk metrics supplemented by details of the thresholds and limits where applicable is presented. The following metrics are in particular the subject of a presentation with a quarterly history: net cost of risk, NPL rate (non-performing loans), coverage rate, average credit quality of portfolios, outstanding corporates placed under surveillance (watchlist), supervision of corporate exposures by sector of activity, *Grands Risques Réglementaires* (major regulatory risk exposures), environmental indicators of portfolio alignment, etc.

A monthly version of the report intended for the Risk Committee of the Board of Directors also provides additional information at a Business Unit level or on certain financing activities. A summary of the thematic CORISQs is also presented.

As part of the monthly CORISQ reporting to General Management, a summary of the main credit files is presented. Thematic presentations also provide recurring clarifications on certain perimeters and activities: personal real estate loans, consumer credit, non-retail credit risk, sector limits, country risks, major regulatory risks (*Grands Risques Réglementaires*), environmental indicators of portfolio alignment, etc.

Specificities of retail portfolios

Audited I Individual and professional portfolio (retail portfolio) have specific features in terms of risk management. This management is based on a statistical approach and on the use of tools and methods in the industrialisation of processes.

STATISTICAL APPROACH

The retail portfolio is made up of a sum of exposures of low unit amounts, validated in a partially automated manner, which together constitute significant outstandings at Group level and therefore a high level of risk.

Given the high number and standardisation of retail clients commitments, aggregate monitoring is necessary at all levels of the Risk function in charge of credit risk. This mass monitoring of retail customer exposure is based on the use of a statistical risk approach and monitoring by homogeneous risk class.

In these circumstances, the risk monitoring system for the Retail portfolio cannot rely on the same procedures or the same tools as for corporates.

For instance, any change in marketing policy (shortening the probationary period for loyalty, delegation of lending decisions to brokers, increase in margins, etc.) can have a rapid and massive impact and must therefore be tracked by a system that allows all actors (i) to identify as quickly as possible where any deterioration in exposures is coming from and (ii) to take remedial action.

Even if the IFRS 9 standard authorises a collective approach and if the Group has a statistical approach on retail customers for the evaluation of the expected loss, the increase in risk for the purposes of the classification into stages is identified on an individual basis for this clientele. The available parameters (operating accounts and late payments) allow the assessment of the significant increase in credit risk at the level of individual exposures. The collective approach is currently only used in a very small number of instances within the Group.

IMPORTANCE OF TOOLS AND METHODS IN THE INDUSTRIALISATION OF PROCESSES

The Risk management function must support Business Units and subsidiary managers in managing their risks with an eye to:

- the effectiveness of lending policies;
- the quality of the portfolio and its development over the lifetime of exposures (from grant to recovery).

Risk Department structures its supervision around the following four processes:

- granting: this decision-making process can be more or less automated depending on the nature and complexity of the transactions, and hence the associated risk;
- monitoring: different entities use different systems for granting and managing retail risks systems (scoring, expert systems, rules, etc.) and an appropriate monitoring system must be in place for each to assess the appropriateness of the grant rules applied (notably *via* monitoring);
- recovery: recovery is an essential stage in the life cycle of Retail portfolio credits and makes a decisive contribution to our control of cost of risk. Whatever the organisation adopted (outsourcing, in-house collection, etc.), the establishment of an effective collection process is an essential element of good risk management. It makes a decisive contribution to controlling the cost of risk and limiting the level of our non-performing loans. If recovery is outsourced, it must conform to the Group's regulations governing outsourcing;
- provisioning: provisions against the Retail portfolio are decided at local level. They are calculated using the methodologies and governance methods defined and approved by the Risk Department. ▲

Monitoring individual concentration

Societe Generale complies with regulations governing large exposures (major regulatory risk exposure cap of 25% of equity). A more restrictive internal limit of 10% delegated by General Management (which can occasionally or permanently amend it) has been put in place. Since 1 July 2018, the High Council for Financial Stability has imposed on banks an exposure limit on the most indebted companies established in France at a maximum level of 5% of eligible equity.

Internal systems are implemented to identify and manage the risks of individual concentrations, particularly at granting of credit. For example, concentration thresholds, based on the internal rating of counterparties, are set by CORISQ and define the governance for validating the limits on individual concentrations. Exposures to groups of clients deemed significant by the Group are reviewed by the Large Exposure Committee chaired by the General Management. As part of the identification of its risks, the Group also carries out loss simulations by type of customer (on significant individual exposures that the Group could have).

The Group uses credit derivatives to reduce some exposures considered to be overly significant. Furthermore, the Group systematically seeks to mutualise risks with other banking partners, at origination or through secondary sales, to avoid keeping an excessive share in operations of large-scale companies.

Monitoring country risk

Country risk arises when an exposure (loan, security, guarantee or derivative) becomes susceptible to negative impact of the country for example from changing regulatory, political, economic, social and financial conditions.

Strictly speaking, the notion of country risk refers to political and non-transfer risk which covers the risk of non-payment resulting from either actions or measures taken by local government authorities (decision to prohibit the debtor from meeting its commitments, nationalisation, expropriation, non-convertibility, etc.), domestic events (riots, civil war, etc.) or external events (war, terrorism, etc.).

More broadly, a deterioration of the credit quality of the country, the Sovereign, or the conditions of activity in the country may result in a commercial risk, with in particular a deterioration of the credit quality of all counterparties in a given country due to a national economic or financial crisis, independently of each counterparty's individual financial situation. This could be a macroeconomic shock (sharp slowdown in activity, systemic banking crisis, etc.), currency depreciation, or sovereign default on external debt potentially entailing other defaults.

Overall limits (except for SUIG – Sovereign Upper Investment Grade countries) and/or monitoring of exposures have been established for countries based on their internal ratings and governance indicators. The supervision is strengthened depending on the level of the country's risk.

Country limits (and in some cases thresholds by country) are approved annually by General Management (or the Risk Department in specific situations). They can be revised downward at any time if the country's situation deteriorates or is expected to deteriorate.

All Group exposures (securities, derivatives, loans and guarantees) are taken into account by this monitoring. The Country Risk methodology determines an initial risk country and a final risk country (after any guarantee-related effects), which is supervised using country limits or threshold (except for SUIG countries).

The procedure for putting a country on watch list is triggered in the event of deterioration in the country risk or anticipation of such a deterioration by the Risk Department.

Sector monitoring

The Group regularly reviews its entire credit portfolio through analyses by business sector. To do this, it relies on industry sector studies (including a one-year anticipation of sectoral risk) and on sectoral concentration analyses.

In addition, the Group periodically reviews its exposures to the portfolio segments presenting a specific risk profile, within the framework of CORISQs at Group level or at Business Unit level. These identified sectors or sub-portfolios are, where appropriate, subject to specific supervision through portfolio exposure limits and specific granting criteria. The limits are monitored either at General Management level or at Business Unit management level depending on the materiality and the level of risk of the portfolios.

As a complement, targeted sector-based research and business portfolio analyses may be requested by General Management, the Risk Department and/or the businesses, depending on current affairs. In that respect, certain sectors weakened in 2022 by the Russian-Ukrainian crisis and its effects have been subject to dedicated monitoring (for example, the electricity and gas supply sector in Europe).

Portfolios specifically monitored by the Group CORISQ include:

- individual and professional credit portfolio (retail) in metropolitan France and in International Retail Banking in Europe. The Group defines in particular a risk appetite target concerning the minimum share covered by *Crédit Logement* guarantee for real estate loans granted to individuals;
- oil and gas sectors, on which the Group has defined a credit policy adapted to the different types of activity of sector players. This policy distinguishes financing guaranteed by oil reserves, project financing, short-term trade finance transactions, and takes into account regional characteristics;
- commercial real estate scope, on which the Group has defined a framework for origination and monitoring of exposures and limits according to the different types of financing, geographical areas and/or activities;
- leveraged finance, for which the Group applies the definition of the scope and the management guidelines recommended by the ECB in 2017 (guidance on leveraged transactions). The Group continues to pay a particular attention to the Leverage Buy-Out (LBO) sub-portfolio, as well as to the highly-leveraged transactions segment;
- exposures on hedge funds is subject to a specific attention. The Group incurs risk on hedge funds through derivative transactions and its financing activity guaranteed by shares in funds. Risks related to hedge funds are governed by individual limits and global limits on market risks and wrong way risks;
- exposures on shadow banking are managed and monitored in accordance with the EBA guidelines published in 2015 which specify expectations regarding the internal framework for identifying, controlling and managing identified risks. CORISQ has set a global exposure threshold for shadow banking.

Credit stress tests

With the aim of identifying, monitoring and managing credit risk, the Risk Department works with the businesses to conduct a set of specific stress tests relating to a country, subsidiary or activity. These specific stress tests combine both recurring stress tests, conducted on those portfolios identified as structurally carrying risk, and *ad hoc* stress tests, designed to recognise emerging risks. Some of these stress tests are presented to CORISQ and used to determine how to frame the corresponding the activities concerned.

Credit risk stress tests complement the global analysis with a more granular approach and allow fine-tuning of the identification, assessment and operational management of risk, including concentration. They allow to calculate the expected credit losses on exposures which have undergone an event of default and on exposures which have not undergone an event of default, in accordance with the method prescribed in the standard IFRS 9. The perimeter covered may include counterparty credit risk on market activities when relevant.

4.5.2 CREDIT RISK HEDGING

Audited I Guarantees and collateral

The Group uses credit risk mitigation techniques for both market and commercial banking activities. These techniques provide partial or full protection against the risk of debtor insolvency.

There are two main categories:

- personal guarantees are commitments made by a third party to replace the primary debtor in the event of the latter's default. These guarantees encompass the protection commitments and mechanisms provided by banks and similar credit institutions, specialised institutions such as mortgage guarantors, monoline or multiline insurers, export credit agencies, States in the context of the health crisis linked to Covid-19 and consequences of Ukraine conflict, etc. By extension, credit insurance and credit derivatives (purchase of protection) also belong to this category;
- collateral can consist of physical assets in the form of personal or real property, commodities or precious metals, as well as financial instruments such as cash, high-quality investments and securities, and also insurance policies.

Appropriate haircuts are applied to the value of collateral, reflecting its quality and liquidity.

In order to reduce its risk-taking, the Group is pursuing active management of its securities, in particular by diversifying them: physical collateral, personal guarantees and others (including Credit Default Swaps).

For information, the mortgage loans of retail customers in France benefit overwhelmingly from a guarantee provided by the financing company *Crédit Logement*, ensuring the payment of the mortgage to the Bank in the event of default by the borrower (under conditions of compliance with the terms of collateral call defined by *Crédit Logement*).

During the credit approval process, an assessment is performed on the value of guarantees and collateral, their legal enforceability and the guarantor's ability to meet its obligations. This process also ensures that the collateral or guarantee successfully meets the criteria set forth in the Capital Requirements Directive (CRD) and in the Capital Requirements Regulation (CRR).

The guarantors are subject to an internal rating updated at least annually. Regarding collateral, regular revaluations are made on the basis of an estimated disposal value composed of the market value of the asset and a discount. The market value corresponds to the value at which the good should be exchanged on the date of the valuation under conditions of normal competition. It is preferably obtained on the basis of comparable assets, failing this by any other method deemed relevant (example: value in use). This value is subject to haircuts depending on the quality of the collateral and the liquidity conditions.

Regarding collateral used for credit risk mitigation and eligible for the RWA calculation, it should be noted that 95% of guarantors are investment grade. These guarantees are mainly provided by *Crédit Logement*, export credit agencies, the French State (within the *Prêts Garantis par l'État* framework of the loans guaranteed by the French State) and insurance companies.

In accordance with the requirements of European Regulation No. 575/2013 (CRR), the Group applies minimum collateralisation frequencies for all collateral held in the context of commitments granted (financial collateral, commercial real estate, residential real estate, other security interests, leasing guarantees).

More frequent valuations must be carried out in the event of a significant change in the market concerned, the default or litigation of the counterparty or at the request of the risk management function. In addition, the effectiveness of credit risk hedging policies is monitored as part of the LGD.

It is the responsibility of the risk management function to validate the operational procedures put in place by the business lines for the periodic valuation of collateral (guarantees and collateral), whether automatic valuations or on an expert opinion and whether during the credit decision for a new competition or during the annual renewal of the credit file.

The amount of guarantees and collateral is capped at the amount of outstanding loans less provisions, i.e. EUR 388.5 billion as at 31 December 2022 (compared with EUR 373 billion as at 31 December 2021), of which EUR 159.5 billion for retail customers and EUR 229.1 billion for other types of counterparties (compared with EUR 175 billion and EUR 198 billion as at 31 December 2021, respectively).

The outstanding loans covered by these guarantees and collateral correspond mainly to loans and receivables at amortised cost, which amounted to EUR 304.8 billion as at 31 December 2022, and to off-balance sheet commitments, which amounted to EUR 75.2 billion (compared with EUR 294 billion and EUR 68 billion as at 31 December 2021, respectively).

The amounts of guarantees and collateral received for performing outstanding loans (Stage 1) and under-performing loans (Stage 2) with payments past due amounted to EUR 2.3 billion as at 31 December 2022 (EUR 2.4 billion as at 31 December 2021), including EUR 0.89 billion on retail customers and EUR 1.4 billion on other types of counterparties (versus EUR 1.5 billion and EUR 0.9 billion at 31 December 2021 respectively).

The amount of guarantees and collateral received for non-performing outstanding loans as at 31 December 2022 amounted to EUR 5.8 billion (compared with EUR 5.2 billion as at 31 December 2021), of which EUR 1.4 billion on retail customers and EUR 3.8 billion on other types of counterparties (compared with EUR 1.8 billion and EUR 3.4 billion respectively as at 31 December 2021). These amounts are capped at the amount of outstanding.

Use of credit derivatives to manage Corporate concentration risk

The Group may use credit derivatives for in the management of its Corporate credit portfolio, primarily to reduce individual, sector and geographic concentrations and to implement a proactive risk and capital management approach.

Housed in the Corporate and Investment Banking arm, the Performance & Scarce Resources management (PSR) team works in close conjunction with the Risk Department and the businesses to reduce excessive portfolio concentrations, react quickly to any deterioration in the creditworthiness of a particular counterparty and recommend actions to improve the capital allocation. PSR is part of the department responsible for defining and effectively deploying the strategy, for monitoring performance and managing the scarce resources in the credit and loan portfolio.

Total outstanding purchases of protection through Corporate credit derivatives is slightly down at EUR 2.3 billion in nominal terms and a corresponding fair value of EUR +3.6 million at the end of December 2022 (compared to EUR 2.5 billion nominal value and a corresponding fair value of EUR -10.3 million at the end of December 2021). New operations have mainly been performed to approve capital allocation (EUR 1.7 billion) and to a lower extend reduce concentration risk (EUR 0.6 billion).

Over 2022, the credit default swaps (CDS) spreads of European investment grade issues (Itraxx index) experienced a significant change around an annual average of 94 bps (compared to 50 bps in 2021). The overall sensitivity of the portfolio (Price Value of a Basis Point) is falling due to the reduction in the average maturity of the protections.

The protection purchases (99% of outstanding as 31 December 2022) are mostly made against European clearing houses, and all against counterparties with "Investment Grade" ratings (rating at least equal to BBB-).

Moreover, the amounts recognised as assets (EUR 1.8 billion as at 31 December 2022 *versus* EUR 0.9 billion as at 31 December 2021) and liabilities (EUR 1.4 billion as at 31 December 2022 *versus* EUR 1.2 billion as at 31 December 2021) correspond to the fair value of credit derivatives mainly held under a transaction activity.

Credit insurance

The Group has developed relationships with private insurers over the last several years to hedge some of its loans against commercial and political non-payment risks.

This activity is performed within a risk framework and monitoring system approved by the Group's General Management. The system is based on an overall limit for the activity, along with sub-limits by maturity, and individual limits for each insurance counterparty, the latter being furthermore required to meet strict eligibility criteria. There is also a limit for insured transactions in Non Investment Grade countries. ▲

TABLE 12: CREDIT RISK MITIGATION TECHNIQUES – OVERVIEW

	31.12.2022				
(In EURm)	Exposures unsecured – Carrying amount	Exposures secured – Carrying amount	of which secured by collateral	of which secured by financial guarantees	of which secured by credit derivatives
Total loans	492,418	304,830	128,393	176,437	-
Total debt securities	50,491	8,444	8,363	81	
TOTAL EXPOSURES	**542,909**	**313,274**	**136,756**	**176,518**	**-**
of which non-performing exposures	*3,362*	*5,042*	*2,389*	*2,653*	*-*
of which defaulted	*3,362*	*5,042*	*2,389*	*2,653*	*-*

The table as at 31 December 2021 has been modified as follows:

	31.12.2021				
(In EURm)	Exposures unsecured – Carrying amount	Exposures secured – Carrying amount	of which secured by collateral	of which secured by financial guarantees	of which secured by credit derivatives
Total loans	455,960	297,738	124,447	173,291	-
Total debt securities	55,998	6,654	6,561	93	
TOTAL EXPOSURES	**511,957**	**304,391**	**131,008**	**173,384**	**-**
of which non-performing exposures	*3,216*	*4,944*	*2,217*	*2,727*	*-*
of which defaulted	*3,216*	*4,944*	*2,217*	*2,727*	*-*

4.5.3 IMPAIRMENT

Information relating to impairment can be found in Note 3.8 to the consolidated financial statements, which is part of Chapter 6 of the present Universal Registration Document.

4.5.4 RISK MEASUREMENT AND INTERNAL RATINGS

General framework of the internal approach

Since 2007, Societe Generale has been authorised by its supervisory authorities to apply, for the majority of its exposures, the internal method (Internal Rating Based method - IRB) to calculate the capital required for credit risk.

The remaining exposures subject to the Standard approach mainly concern the portfolios of retail customers and SMEs (Small and Medium Enterprises) of the International Retail Banking activities. For exposures processed under the standard method excluding retail customers, which does not use the external note, the Group mainly uses external ratings from the Standard & Poor's, Moody's and Fitch rating agencies and the Banque de France. In the event that several Ratings are available for a third party, the second-best rating is applied.

The rating model monitoring framework is operational, in accordance with regulatory requirements, and detailed below in this section 4.5.4 *"Risk measurement and internal ratings"*.

In accordance with the texts published by the EBA as part of the "IRB Repair" programme and following the review missions carried out by the ECB (TRIM – Targeted Review of Internal Models), the Group is reviewing its internal model system credit risk, so as to comply with these new requirements. A programme dubbed Haussmann was launched in this respect in the Group, and deals with aspects such as:

- the simplification of the architecture of the models, and the improvement of its auditability: either by *ex nihilo* development of new models based on the New Definition of Default (NDoD), and natively integrating the expectations of the EBA and ECB, or by bringing certain existing models up to the new standards;
- improving the quality of data and its traceability throughout the chain;
- the review of the roles and responsibilities of the teams, particularly with regard to building and monitoring the system (backtesting);
- the review of certain IT application bricks, and their rationalisation;
- the establishment of a more complete normative base, and a more consistent relationship with the supervisor.

The roll-out plan also incorporates the changes decided as part of the Haussmann remediation program of the IRB Group system.

Following the TRIMs and as part of compliance with IRB Repair, evolutions to the rating systems and models have been and will be submitted for validation to the ECB.

Audited I To calculate its capital requirements under the IRB method, Societe Generale estimates the Risk-Weighted Assets (RWA) and the Expected Loss (EL) that may be incurred in light of the nature of the transaction, the quality of the counterparty (*via* internal rating) and all measures taken to mitigate risk.

The calculation of RWA is based on the Basel parameters, which are estimated using the internal risk measurement system:

- the Exposure at Default (EAD) value is defined as the Group's exposure in the event that the counterparty should default. The EAD includes exposures recorded on the balance sheet (such as loans, receivables, accrued income, etc.), and a proportion of off-balance sheet exposures calculated using internal or regulatory Credit Conversion Factors (CCF);
- the Probability of Default (PD): the probability that a counterparty will default within one year;
- the Loss Given Default (LGD): the ratio between the loss on an exposure in the event a counterparty defaults and the amount of the exposure at the time of the default.

The estimation of these parameters is based on a quantitative evaluation system which is sometimes supplemented by expert or business judgment.

In addition, a set of procedures sets out the rules relating to ratings (scope, frequency of review, grade approval procedure, etc.) as well as those for supervision, backtesting and the validation of models. These procedures allow, among other things, to facilitate critical human judgment, an essential complement to the models for non-retail portfolios.

The Group also takes into account:

- the impact of guarantees and credit derivatives, by substituting the PD, the LGD and the risk-weighting calculation of the guarantor for that of the obligor (the exposure is considered to be a direct exposure to the guarantor) in the event that the guarantor's risk weighting is more favorable than that of the obligor;
- collateral used as guarantees (physical or financial). This impact is taken into account *via* the LGD level. ▲

To a very limited extent, Societe Generale also applies an IRB Foundation approach (where only the probability of default is estimated by the Bank, while the LGD and CCF parameters are determined directly by regulation) to a portfolio of specialised lending exposures, including those granted to the subsidiaries Franfinance Entreprises, Sogelease and Star Lease.

Moreover, the Group has authorisation from the regulator to use the IAA (Internal Assessment Approach) method to calculate the regulatory capital requirement for ABCP (Asset-Backed Commercial Paper) securitisation.

In addition to the capital requirement calculation objectives under the IRBA method, the Group's credit risk measurement models contribute to the management of the Group's operational activities. They also constitute tools to structure, price and approve transactions and contribute to the setting of approval limits granted to business lines and the Risk function.

TABLE 13: SCOPE OF THE USE OF IRB AND SA APPROACHES

	31.12.2022					
(In EURm)	Exposure value as defined in Article 166 CRR for exposures subject to IRB approach	Total exposure value for exposures subject to the Standardised approach and to the IRB approach	Percentage of total exposure value subject to the permanent partial use of the SA *(%)*	Percentage of total exposure value subject to a roll-out plan *(%)*	Percentage of total exposure value subject to IRB approach *(%)*	of which percentage subject to AIRB approach *(%)*
Central governments or central banks	252,471	260,328	2.58%	0.00%	97.42%	97.15%
of which regional governments or local authorities		*805*	*19.01%*	-	*80.99%*	*80.99%*
of which public sector entities		*67*	*91.66%*	-	*8.34%*	*8.33%*
Institutions	38,589	44,930	7.54%	0.93%	91.54%	91.53%
Corporates	287,105	331,166	8.11%	1.71%	90.18%	88.40%
of which Corporates – Specialised lending, excluding slotting approach		*72,490*	*1.52%*	-	*98.48%*	*98.48%*
of which Corporates – Specialised lending under slotting approach		*1,255*	-	-	*100.00%*	*100.00%*
Retail	193,661	238,959	15.30%	4.33%	80.38%	80.38%
of which Retail – Secured by real estate SMEs		*6,263*	*13.74%*	*0.09%*	*86.17%*	*86.17%*
of which Retail – Secured by real estate non-SMEs		*140,400*	*9.30%*	*0.15%*	*90.55%*	*90.55%*
of which Retail – Qualifying revolving		*5,598*	*17.57%*	*24.04%*	*58.38%*	*58.38%*
of which Retail – Other SMEs		*36,089*	*22.70%*	*13.70%*	*63.60%*	*63.60%*
of which Retail – Other non-SMEs		*50,609*	*26.61%*	*7.57%*	*65.82%*	*65.82%*
Equity	5,104	6,335	19.44%	-	80.56%	80.56%
Other non-credit obligation assets	752	39,569	98.10%	-	1.90%	1.90%
TOTAL	**777,682**	**921,287**	**12.33%**	**1.78%**	**85.89%**	**85.17%**

TABLE 14: SCOPE OF APPLICATION OF THE IRB AND STANDARD APPROACHES FOR THE GROUP

	IRB approach	Standard approach
French Retail Banking and Private Banking	Majority of French Retail Banking (including Boursorama) and Private Banking portfolios	Some specific client or product types for which the modeling is currently not adapted SG Kleinwort Hambros subsidiary
International Retail Banking and Financial Services	Subsidiaries KB (Czech Republic), CGI, Fiditalia, GEFA, SG Leasing SPA and Fraer Leasing SPA, SGEF Italy	Other international subsidiaries (in particular BRD, SG Maroc, Hanseatik) Car Leasing (ALD)
Global Banking and Investor Solutions	Majority of Corporate and Investment Banking portfolios	SGIL subsidiary, as well as specific client or product types for which the modeling is currently not adapted

Credit risk measurement for wholesale clients

The Group has implemented the following system for Corporate (including specialised financing), Banking and Sovereign portfolios.

RATING SYSTEM AND ASSOCIATED PROBABILITY OF DEFAULT

The rating system consists of assigning a score to each counterparty according to a specific internal scale per rating system (set of counterparties treated homogeneously whether in terms of granting, rating tool or recovery process). For perimeters on which an internal scale reviewed according to EBA IRB Repair standards has not yet been validated by the supervisor, each grade corresponds to a probability of default determined using historical series observed by Standard & Poor's for over more than twenty years.

The following table presents the indicative corresponding scales of the main external credit rating agencies and the corresponding average probabilities of default, as well as the Group's internal rating scale.

The rating assigned to a counterparty is generally proposed by a model, and possibly adjusted by a credit analyst, who then submits it for validation to the Risk Management function.

The counterparty rating models are structured in particular according to the type of counterparty (companies, financial institutions, public entities, etc.), geographic region and size of the Company (usually assessed through its annual revenue).

The Company rating models are underpinned by statistical models (regression methods) based on client default observations. They combine quantitative parameters derived from financial data that evaluate the sustainability and solvency of companies and qualitative parameters that evaluate economic and strategic dimensions.

TABLE 15: SOCIETE GENERALE'S INTERNAL RATING SCALE AND INDICATIVE CORRESPONDING SCALES OF RATING AGENCIES[1]

Investment grade/ Non-investment grade	Probability of default range	Counterparty internal rating	Indicative equivalent Standard & Poor's	Indicative equivalent Fitch	Indicative equivalent Moody's	1 year internal probality of default (average)
Investment grade	0.00 to < 0.10	1	AAA	AAA	Aaa	0.009%
		2+	AA+	AA+	Aa1	0.014%
		2	AA	AA	Aa2	0.020%
		2-	AA-	AA-	Aa3	0.026%
		3+	A+	A+	A1	0.032%
		3	A	A	A2	0.036%
		3-	A-	A-	A3	0.061%
	0.10 to < 0.15	4+	BBB+	BBB+	Baa1	0.130%
	0.15 to < 0.25					
	0.25 to < 0.50	4	BBB	BBB	Baa2	0.257%
	0.50 to < 0.75	4-	BBB-	BBB-	Baa3	0.501%
Non-investment grade	0.75 to < 1.75	5+	BB+	BB+	Ba1	1.100%
	1.75 to < 2.5	5	BB	BB	Ba2	2.125%
	2.5 to < 5	5-	BB-	BB-	Ba3	3.260%
		6+	B+	B+	B1	4.612%
	5 to < 10	6	B	B	B2	7.761%
	10 to < 20	6-	B-	B-	B3	11.420%
		7+	CCC+	CCC+	Caa1	14.328%
	20 to < 30	7	CCC	CCC	Caa2	20.441%
		7-	C/CC/CCC-	CCC-	Caa3	27.247%
	30 to < 100					

LGD MODELS

The Loss Given Default (LGD) is an economic loss that is measured by taking into account all parameters pertaining to the transaction, as well as the fees incurred for recovering the receivable in the event of a counterparty default.

The models used to estimate the Loss Given Default (LGD) excluding retail clients are applied by regulatory sub-portfolios, type of asset, size and location of the transaction or of the counterparty, depending on whether or not collateral has been posted, and the nature thereof if applicable. This makes it possible to define homogeneous risk pools, particularly in terms of recovery, procedures and the legal environment.

These estimates are founded on statistics when the number of loans in default is sufficient. In such circumstances, they are based on recovery data observed over a long period. When the number of defaults is insufficient, the estimate is revised or determined by an expert.

CREDIT CONVERSION FACTOR (CCF) MODELS

For its off-balance sheet exposures, the Group is authorised to use the internal approach for "Term loan with drawing period" products and revolving credit lines.

(1) The Group is in the process of implementing a multi-scale approach differentiated by rating system.

TABLE 16: MAIN CHARACTERISTICS OF MODELS AND METHODS – WHOLESALE CLIENTS

Parameter modeled	Portfolio/ Category of Basel assets	Number of methods, models	Methodology Number of years default/loss
Wholesale clients			
Probability of Default (PD)	Sovereigns	1 method.	Econometric method. Low default portfolio.
	Public sector entities	4 models according to geographic region.	Statistical (regression)/expert methods for the rating process, based on the combination of financial ratios and a qualitative questionnaire. Low default portfolio.
	Financial institutions	11 models according to type of counterparty: banks, insurance, funds, financial intermediaries, funds of funds.	Expert models based on a qualitative questionnaire. Low default portfolio.
	Specialised financing	3 models according to type of transaction.	Expert models based on a qualitative questionnaire. Low default portfolio.
	Large corporates	9 models according to geographic region.	Mainly statistical models (regression) for the rating process, based on the combination of financial ratios and a qualitative questionnaire. Defaults observed over a period of 8 to 10 years.
	Small- and medium-sized companies	21 models according to the size of the Company and the geographic region.	Mainly statistical models (regression) for the rating process, based on the combination of financial ratios and a qualitative questionnaire, behavioral score. Defaults observed over a period of 8 to 10 years.
Loss Given Default (LGD)	Public sector entities – Sovereigns	6 models according to type of counterparty.	Calibration based on historical data and expert judgments. Losses observed over a period of more than 10 years.
	Large corporates – Flat-rate Approach	25 models Flat-rate approach according to type of collateral.	Calibration based on historical data adjusted by expert judgments. Losses observed over a period of more than 10 years.
	Large corporates – Discount Approach	16 models Discount approach according to type of recoverable collateral.	Statistical calibration based on historical market data adjusted by expert judgments. Losses observed over a period of more than 10 years.
	Small- and medium-sized companies	17 models Flat-rate approach according to type of collateral or unsecured.	Statistical calibration based on historical data adjusted by expert judgments. Losses observed over a period of more than 10 years.
	Project financing	9 models Flat-rate approach according to project type.	Statistical calibration based on historical data adjusted by expert judgments. Losses observed over a period of more than 10 years.
	Financial institutions	5 models Flat-rate approach according to type of counterparty: banks, insurance, funds, etc. and the nature of the collateral.	Statistical calibration based on historical data adjusted by expert judgments. Losses observed over a period of more than 10 years.
	Other specific portfolios	6 models: factoring, leasing with option to purchase and other specific cases.	Statistical calibration based on historical data adjusted by expert judgments. Losses observed over a period of more than 10 years.
Credit Conversion Factor (CCF)	Large corporates	5 models: term loans with drawing period, revolving credits, Czech Corporates.	Models calibrated by segment. Defaults observed over a period of more than 10 years.
Expected Loss (EL)	Real estate transactions	2 models by slotting.	Statistical model based on expert judgments and a qualitative questionnaire. Low default portfolio.

MONITORING THE PERFORMANCE OF INTERNAL MODELS

The performance level of the entire wholesale client credit system is measured by backtests that compare, by portfolio, the PD, LGD and CCF estimates with actual results, thus making it possible to measure the prudence of the risk parameters used in the IRB approach.

The backtest results and remediation plans are presented to the Expert Committee for discussion and approval (see section "Governance of the modelling of credit risk"). These results may justify the implementation of remediation plans if the system is deemed to be insufficiently prudent. The discriminating power of the models and the change of the composition of the portfolio are also measured.

The results presented above cover the entire Group portfolios. Backtests compare the estimated probability of default (arithmetic mean weighted by debtors) with the observed results (the historical annual default rate). The historical default rate was calculated on the basis of performing exposures over the period from 2008 to 2021.

The historic default rate remains stable across all the exposure classes. The estimated probability of default is higher than the historical default rates for all Basel portfolios and for most of the ratings. It should be noted that new internal models are being developed to comply with new regulatory requirements.

TABLE 17: COMPARISON OF RISK PARAMETERS: ESTIMATED AND ACTUAL PD VALUES – WHOLESALE CLIENTS – IRBA

	31.12.2022					
Exposure class	**Weighted average PD** *(%)*	**Arithmetic mean of debtor PD** *(%)*	**Historical average annual default rate** *(%)*	**Average annual default rate** *(%)*	**Number of debtors Year-end**[(1)]	**of which number of debtors in default during the year**
Central banks and central administrations	0.5%	1.1%	0.2%	0.7%	421	3
Institutions	0.4%	0.8%	0.3%	0.2%	3,427	8
Corporates – SME	3.2%	4.2%	3.3%	1.9%	61,004	1,166
Corporates – Specialised lending	1.8%	2.7%	1.8%	1.6%	2,407	39
Corporates – Others	1.4%	3.9%	1.7%	1.3%	25,319	322

(1) Performing exposures.

	31.12.2021					
Exposure class	**Weighted average PD** *(%)*	**Arithmetic mean of debtor PD** *(%)*	**Historical average annual default rate** *(%)*	**Average annual default rate** *(%)*	**Number of debtors Year-end**[(1)]	**of which number of debtors in default during the year**
Central banks and central administrations	0.6%	1.3%	0.2%	0.2%	451	1
Institutions	0.5%	0.8%	0.3%	0.1%	3,480	3
Corporates – SME	2.9%	4.3%	3.4%	1.6%	61,326	988
Corporates – Specialised lending	1.8%	2.8%	1.9%	1.0%	2,255	22
Corporates – Others	1.3%	3.9%	1.8%	1.2%	24,625	301

(1) Performing exposures.

TABLE 18: COMPARISON OF RISK PARAMETERS: ESTIMATED AND ACTUAL PD VALUES – WHOLESALE CLIENTS – IRBF

	31.12.2022					
Exposure class	**Weighted average PD** *(%)*	**Arithmetic mean of debtor PD** *(%)*	**Historical average annual default rate** *(%)*	**Average annual default rate** *(%)*	**Number of debtors Year-end**[(1)]	**of which number of debtors in default during the year**
Central banks and central administrations	0.3%	0.3%	0.0%		11	
Institutions	0.6%	0.8%	0.2%		18	
Corporates – SME	3.4%	4.6%	3.4%	2.3%	11,971	277
Corporates - Specialised financing						
Corporates – Others	2.0%	4.2%	2.0%	1.7%	6,259	108

(1) Performing exposures.

	31.12.2021					
Exposure class	**Weighted average PD** *(%)*	**Arithmetic mean of debtor PD** *(%)*	**Historical average annual default rate** *(%)*	**Average annual default rate** *(%)*	**Number of debtors Year-end**[(1)]	**of which number of debtors in default during the year**
Central banks and central administrations	0.6%	0.0%	0.0%	0.0%	102	0
Institutions	0.4%	1.2%	0.2%	0.0%	27	0
Corporates – SME	3.5%	5.0%	3.5%	2.5%	11,220	275
Corporates - Specialised financing						
Corporates – Others	2.3%	4.5%	2.0%	2.0%	6,511	131

(1) Performing exposures.

TABLE 19 : COMPARISON OF RISK PARAMETERS : ESTIMATED AND ACTUAL LGD WHOLESALE CLIENTS

	31.12.2021	
Basel Portfolio	**LGD IRBA[1]**	**Estimated losses excluding margin of prudence**
Large corporates	37%	32%
Small and medium sized companies	39%	26%

(1) Senior unsecured LGD.
The "observed EAD/IRBA EAD" ratio calculation method is being revised.

Credit risk measurements of retail clients

The Group has implemented the following system for the retail portfolio made up of individual customers, SCIs (real estate investment companies – *Sociétés civiles immobilières*) and professional customers.

RATING SYSTEM AND ASSOCIATED PROBABILITY OF DEFAULT

The modeling of the probability of default of retail client counterparties is carried out specifically by each of the Group's subsidiaries using the IRBA method in consumer finance activities, equipment finance or in the Czech Republic. For French retail network, modelling is centralised within Group Risk Division. The models incorporate data on the account behavior of counterparties. They are segmented by type of customer and distinguish between retail customers, professional customers, very small businesses and real estate investment companies.

The counterparties of each segment are classified automatically, using statistical models, into homogeneous risk pools, each of which is assigned a probability of default. These estimates are adjusted by a safety margin to estimate as best as possible a complete default cycle, using a through-the-cycle (TTC) approach.

LGD MODELS

The models for estimating the Loss Given Default (LGD) of retail customers are specifically applied by business line portfolio and by product, according to the existence or not of collateral.

The expected losses are estimated using internal long-term historical recovery data for exposures that have defaulted. These estimates are adjusted by safety margins in order to reflect the possible impact of a downturn.

CCF MODELS

For its off-balance sheet exposures, Societe Generale applies its estimates for revolving loans and overdrafts on current accounts held by retail and professional customers.

TABLE 20: MAIN CHARACTERISTICS OF MODELS AND METHODS USED – RETAIL CLIENTS

Parameter modeled	Portfolio/ Category of Basel assets	Number of models	Methodology Number of years of default/loss
Retail clients			
Probability of Default (PD)	Residential real estate	7 models according to entity, type of guarantee (security, mortgage), type of counterparty: individuals or professionals/VSB, real estate investment company (SCI).	Statistical model (regression), behavioral score. Defaults observed over a period of more than five years.
	Other loans to individual customers	15 models according to entity and to the nature and object of the loan: personal loan, consumer loan, car loan, etc.	Statistical model (regression), behavioral score. Defaults observed over a period of more than five years.
	Renewable exposures	4 models according to entity and nature of the loan: overdraft on current account, revolving credit or consumer loan.	Statistical model (regression), behavioral score. Defaults observed over a period of more than five years.
	Professionals and very small businesses (VSB)	10 models according to entity, nature of the loan (medium- and long-term investment credits, short-term credit, car loans), and type of counterparty (individual or real estate investment company (SCI)).	Statistical model (regression or segmentation), behavioral score. Defaults observed over a period of more than five years.
Loss Given Default (LGD)	Residential real estate	10 models according to entity, type of guarantee (security, mortgage), and type of counterparty: individuals or professionals/VSB, real estate investment company (SCI).	Statistical model of expected recoverable flows based on the current flows. Losses and recoverable flows observed over a period of more than 10 years.
	Other loans to individual customers	18 models according to entity and to the nature and object of the loan: personal loan, consumer loan, car loan, etc.	Statistical model of expected recoverable flows based on the current flows. Model adjusted by expert opinions if necessary. Losses and recoverable flows observed over a period of more than 10 years.
	Renewable exposures	7 models according to entity and nature of the loan: overdraft on current account, revolving credit or consumer loan.	Statistical model of expected recoverable flows based on the current flows. Model adjusted by expert opinions if necessary. Losses and recoverable flows observed over a period of more than 10 years.
	Professionals and very small businesses	12 models according to entity, nature of the loan (medium- and long-term investment credits, short-term credit, car loans), and type of counterparty (individual or real estate investment company (SCI)).	Statistical model of expected recoverable flows based on the current flows. Model adjusted by expert opinions if necessary. Losses and recoverable flows observed over a period of more than 10 years.
Credit Conversion Factor (CCF)	Renewable exposures	12 calibrations by entity for revolving products and personal overdrafts.	Models calibrated by segment over a period of observation of defaults of more than five years.
	Residential real estate	4 calibrations by entity for real estate.	CCF flat rate of 100%. Relevance of this flat rate CCF is confirmed through the draw-down rate observed over a period of more than five years.

MONITORING THE PERFORMANCE OF INTERNAL MODELS

The performance level of the entire retail client credit system is measured by backtests, which check the performance of PD, LGD and CCF models and compare estimates with actual results.

Each year, the average long-term default rates observed by homogeneous risk class are compared to the PDs.

The results presented below cover all of the Group’s portfolios. Backtests compare the estimated probability of default (arithmetic average weighted by the debtors) to the observed results (the historical annual default rate). The historical default rate was calculated on the basis of healthy outstandings over the period from 2010 to 2021. Creditors are included in accordance with the revised instructions of the EBA publication of 14 December 2016 (EBA/GL/2016/11).

After a year in 2021 marked by the end of the health crisis and a historically low level of risk, the economic situation deteriorated in 2022. The impact of the war in Ukraine (energy crisis, inflation, commodity prices, etc.) is weighing on companies already weakened by the health crisis and which have taken out EMPs. Increasing costs to professionals are impacting their cash flow and leading to a deterioration in risk profiles. We see both a degradation of risk classes - corresponding to a renormalisation effect in relation to the COVID period in which counterparties had received government aid - and a revival of defaults, in particular on PRO clients with a PGE.

The private market is more resilient, especially in the real estate portfolio. Nevertheless, a rise in risk was observed on consumer credit over the year-end, but it did not reach pre-crisis levels. Indeed, this rise follows a year in 2021, when indicators reached record-low levels.

It should be noted that new internal models, the development of which is finalised or planned, will make it possible to comply with the latest regulatory requirements.

TABLE 21: COMPARISON OF ESTIMATED RISK PARAMETERS: ESTIMATED AND ACTUAL PD VALUES – RETAIL CLIENTS (IRBA)[1]

	31.12.2022					
Exposure class	Weighted average PD (%)	Arithmetic mean of debtor PD (%)	Historical average annual default rate (%)	Average annual default rate (%)	Number of debtors Year-end	of which number of debtors in default during the year
Retail – Secured by real estate SME	1.2%	1.4%	2.1%	1.1%	31,856	359
Retail – Secured by real estate non-SME	0.7%	0.9%	0.8%	0.3%	1,160,703	3,104
Retail – Qualifying revolving	2.4%	2.5%	1.9%	1.5%	5,582,728	85,477
Retail – Other SME	3.1%	3.4%	3.3%	2.8%	553,086	15,243
Retail – Other non – SME	2.3%	3.7%	3.2%	2.2%	1,860,932	40,748

	31.12.2021					
Exposure class	Weighted average PD (%)	Arithmetic mean of debtor PD (%)	Historical average annual default rate (%)	Average annual default rate (%)	Number of debtors Year-end	of which number of debtors in default during the year
Retail – Secured by real estate SME	1.5%	1.6%	2.2%	1.1%	33,475	369
Retail – Secured by real estate non-SME	0.8%	0.8%	0.9%	0.3%	1,171,550	3,520
Retail – Qualifying revolving	3.1%	2.6%	1.9%	1.4%	5,701,905	80,316
Retail – Other SME	2.9%	2.9%	3.4%	2.2%	770,826	17,118
Retail – Other non – SME	2.1%	3.3%	3.3%	1.7%	1,824,511	30,380

(1) Performing exposures.

TABLE 22: COMPARISON OF RISK PARAMETERS: ESTIMATED AND ACTUAL LGD AND EAD VALUES – RETAIL CLIENTS

	31.12.2022		
Basel portfolio	**A-IRB LGD**	**Estimated losses excluding margin of prudence**	**Observed EAD/ A-IRB EAD**
Real estate loans (excl. guaranteed exposures)	18%	12%	-
Revolving credits	49%	21%	79%
Other loans to individual customers	30%	25%	-
VSB and professionals	28%	19%	77%
Total Group retail clients	**26%**	**19%**	**79%**

The changes in estimated losses can be explained by a change in backtesting methodology (1-time calculation).

The changes in EAD can be explained by the implementation of new models.

The changes in the "Other loans to individual customers" can be explained by a change in scope.

	31.12.2021		
Basel portfolio	**A-IRB LGD**	**Estimated losses excluding margin of prudence**	**Observed EAD/ A-IRB EAD**
Real estate loans (excl. guaranteed exposures)	18%	9%	-
Revolving credits	48%	43%	66%
Other loans to individual customers	28%	23%	-
VSB and professionals	29%	22%	72%
Total Group retail clients	**26%**	**19%**	**68%**

Governance of the modeling of credit risk

Credit own funds estimation models are subject to the global model risk management framework (see Chapter 4.12 *"Model risk"*).

The first line of defence is responsible for designing, putting into production, using and monitoring models, in compliance with model risk management governance rules throughout the model lifecycle, which include for credit risk internal models traceability of development and implementation stages and annual backtesting. Depending on the specificities of each model family, in particular depending on the regulatory environment, the second line of defence (LOD2) may decide to perform the backtesting of the model family. In such case the LOD2 is responsible for defining a dedicated standard for the model family and informing the first line of defence (starting with the model owner) of the outcome of the backtesting.

The Model Risk Department, reporting directly to the Risk Department, acts as a second line of defence for all credit risk models. Independent model review teams rely, for the conduct of their missions, on principles of control of the theoretical robustness (assessment of the quality of the design and development) of the models, the conformity of the implementation and the use, the continuous follow-up of model relevance over time. The independent review process concludes with (i) a report summarising the scope of the review, the tests performed, the results of the review, the conclusions or recommendations and with (ii) Reviewing and Approval Committees (respectively *Comité Modèles* and *Comité Experts* in the case of credit risk models). The model control system gives rise to recurring reports to the Risk Department within the framework of various bodies and processes (Group Model Risk Management Committee, Risk Appetite Statement/Risk Appetite Framework, monitoring of recommendations, etc.) and annually to the General Management (CORISQ). The Model Risk Department reviews, amongst others, new models, backtesting results and any change to the credit own funds estimation models. In accordance with the Delegated Regulation (EU) No. 529/2014 of 20 May 2014 relating to the follow-up of internal models used for own funds computation, any model change to the Group's credit risk measurement system is then subjected to two main types of notification to the competent supervisor, depending on the significant nature of the change laid down by this regulation itself:

- significant changes which are subject to a request for approval prior to their implementation;
- other changes which should be notified to the competent authorities: (i) prior to their implementation: changes, according to the criteria defined by the regulation, are notified to the Supervisor (*ex-ante* notification); barring a negative response, these may be implemented within a two months period; (ii) after their implementation: these changes are notified to the competent authorities after their implementation at least once a year, through a specific report (*ex-post* notification).

The Internal Audit Department, as a third line of defence, is responsible for periodically assessing the overall effectiveness of the model risk management framework (relevance of the model risk governance and efficiency of second line of defence activities) and performing the independent model audit.

Climate risk – Measuring sensitivity to transition risk

Audited I Transition risk's impact on Societe Generale Corporate clients' credit risk has been identified as one of the main climate change-related risk for the Group.

In order to measure this impact, the Group is gradually implementing a Corporate Climate Vulnerability Indicator (CCVI) which aims to reinforce the credit analysis on the most exposed counterparties. ▲

(See section 4.13.4 "*Incorporating the environment in the risk management framework*" page 279).

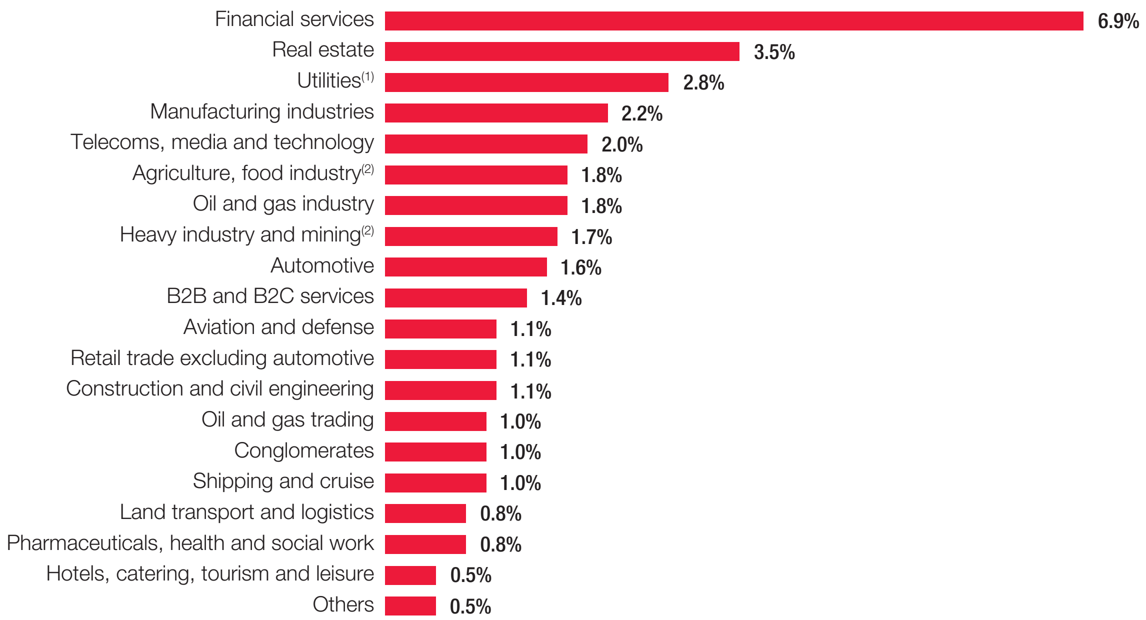
4.5.5 QUANTITATIVE INFORMATION

Audited I In this section, the measurement used for credit exposures is the EAD – Exposure At Default (on- and off-balance sheet). Under the Standardised Approach, the EAD is calculated net of collateral and provisions. ▲

The grouping of business segments was reviewed in 2022 in order to comply with internal credit risk monitoring methodologies and new reporting requirements from EBA on sectors. The grouping used is based on the main economic activity of counterparties. The EAD is broken down according to the guarantor's characteristics, after taking into account the substitution effect (unless otherwise indicated).

More information available in sections 6.5 *"Quantitative information"* and 6.6 *"Additional quantitative information on credit risk"* in the Risk Report Pillar 3 document.

SECTOR BREAKDOWN OF GROUP CORPORATE EXPOSURE ON TOTAL GROUP EXPOSURE (BASEL PORTFOLIO)



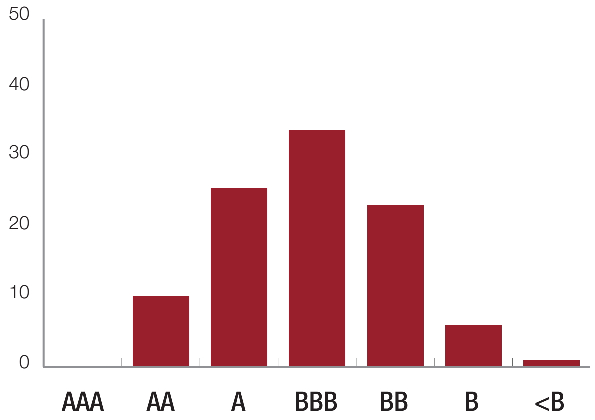
The EAD of the Corporate portfolio is presented in accordance with the Basel rules (large corporates, including insurance companies, funds and hedge funds, SMEs, specialised financing, factoring businesses), based on the obligor's characteristics, before taking into account the substitution effect (credit risk scope: debtor, issuer and replacement risk).

At 31 December 2022, the Corporate portfolio amounted to EUR 390 billion out of a total of EUR 1,119 billion for the group (on- and off-balance sheet exposures measured in EAD). The Group's exposure to its ten largest Corporate counterparties accounted for 5% of this portfolio.

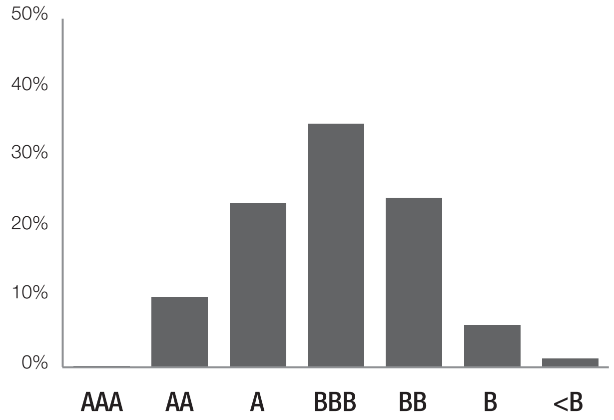
(1) Including power activities (2.5%).
(2) Including trading activities.

Corporate and banking clients' exposure

BREAKDOWN OF RISK BY INTERNAL RATING FOR CORPORATE CLIENTS AT 31 DECEMBER 2022 (AS % OF EAD)



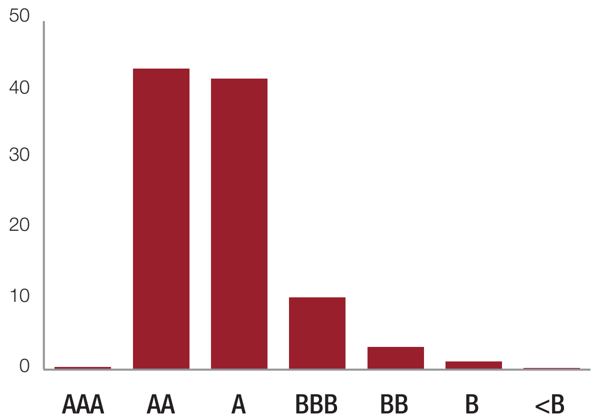
BREAKDOWN OF RISK BY INTERNAL RATING FOR CORPORATE CLIENTS AT 31 DECEMBER 2021 (AS % OF EAD)



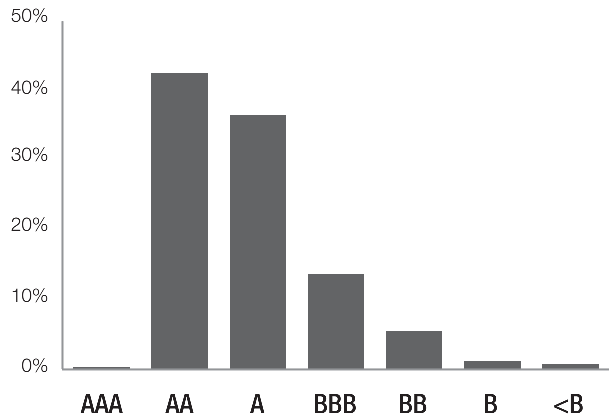
The scope includes performing loans recorded under the IRB method (excluding prudential classification criteria, by weight, of specialised financing) for the entire Corporate client portfolio, all divisions combined, and represents EAD of EUR 318 billion (out of total EAD for the Basel Corporate client portfolio of EUR 351 billion, standard method included). The breakdown by rating of the Group’s Corporate exposure demonstrates the sound quality of the portfolio. It is based on an internal counterparty rating system, presented above as its Standard & Poor’s equivalent.

At 31 December 2022, the majority of the portfolio (70% of Corporate clients) had an investment grade rating, i.e. counterparties with an S&P-equivalent internal rating higher than BBB-. Transactions with non-investment grade counterparties were very often backed by guarantees and collateral in order to mitigate the risk incurred.

BREAKDOWN OF RISK BY INTERNAL RATING FOR BANKING CLIENTS AT 31 DECEMBER 2022 (AS % OF EAD)



BREAKDOWN OF RISK BY INTERNAL RATING FOR BANKING CLIENTS AT 31 DECEMBER 2021 (AS % OF EAD)



The scope used for banking clients corresponds to performing loans recorded under the IRB method on all Banking portfolios, including all core businesses, and represents EAD of EUR 58 billion (out of total EAD for the Basel Banking portfolio of EUR 95 billion, standard method included). The breakdown by rating of the Group's exposure to banking counterparties of Group Societe Generale demonstrates the sound quality of the portfolio. It is based on the internal counterparty rating system, presented above as its Standard & Poor's equivalent. At 31 December 2022, the majority of the Banking client exposure involved investment-grade counterparties (96% of the exposure).

Change in risk-weighted assets (RWA) and capital requirements for credit and counterparty credit risks

TABLE 23: CHANGE IN RISK-WEIGHTED ASSETS (RWA) BY APPROACH (CREDIT AND COUNTERPARTY CREDIT RISKS)

(In EURm)	RWA - IRB	RWA - Standard	RWA - Total	Capital requirements - IRB	Capital requirements - Standard	Capital requirements - total
RWA as at end of previous reporting period (31.12.2021)	**192,368**	**109,682**	**302,051**	**15,389**	**8,775**	**24,164**
Asset size	(3,165)	(1,264)	(4,429)	(253)	(101)	(354)
Asset quality	2,100	1,785	3,886	168	143	311
Model updates	7,758	-	7,758	621	-	621
Methodology and policy	(3,849)	(4,115)	(7,965)	(308)	(329)	(637)
Acquisitions and disposals	1,238	(7,253)	(6,015)	99	(580)	(481)
Foreign exchange movements	2,122	476	2,598	170	38	208
Other			-	-	-	-
RWA as at end of reporting period (31.12.2022)	198,572	99,311	297,883	15,886	7,945	23,831

The table above presents the data without CVA (Credit Valuation Adjustment).

The main effects explaining the EUR 4 billion decrease in RWA (excluding CVA) in 2021 are as follows:

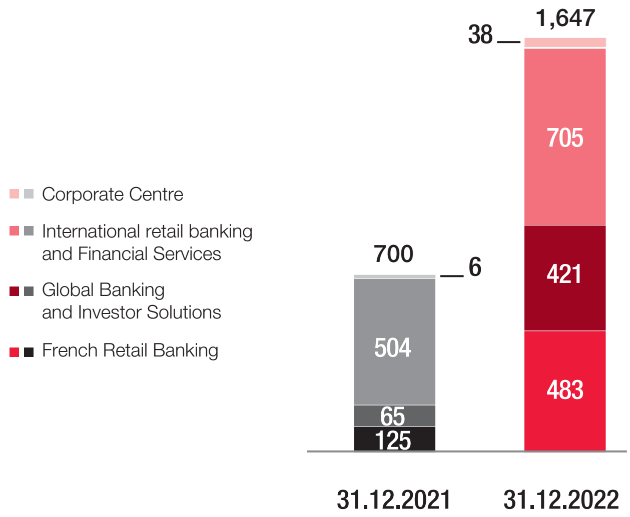
- an acquisitions and disposals effect of EUR -6.0 billion mainly related to the disposal of the Rosbank entity;
- a methodological effect of EUR -8.0 billion mainly on :
  - Counterparty risk mainly related to efforts to improve the efficiency of CCR EAD calculations and the agreement of the authorities for the recognition and application of a netting on Chinese counterparties.
  - Credit risk mainly on the off-balance sheet due to the inclusion of cash flows in the calculation of the financial maturity.
- a model effect of EUR +7.8 billion euros linked to the remediation of models following the TRIM review and the entry into effect of IRB Repair;
- a foreign exchange effect of EUR +2.6 billion euros mainly linked to the appreciation of the US dollar against the euro.

The effects are defined as follows:

- asset size: organic changes in book size and composition (including the creation of new business lines and maturing loans) but excluding changes due to acquisitions and disposals of entities;
- asset quality: changes in the quality of the Bank's assets due to changes in borrower risk, such as rating grade migration or similar effects;
- model updates: changes due to model implementation, changes in model scope or any changes intended to address model weaknesses;
- methodology and policy: changes due to methodological changes in calculations driven by regulatory changes, including both revisions to existing regulations and new regulations;
- acquisitions and disposals: changes in book size due to acquisitions and disposals of entities;
- foreign exchange movements: changes arising from market fluctuations, such as foreign currency translation movements;
- other: this category is used to capture changes that cannot be attributed to any other categories.

Net cost of risk

CHANGE IN GROUP NET COST OF RISK (IN EURM)



The Group's net cost of risk in 2022 was EUR -1 647 million, up by 135% compared to 2021. This higher cost of risk compared to a low 2021 reference base is explained by a cost of risk which remains low on defaulted outstandings (stage 3), 17 bp compared to 18 bp in 2021, and provisions on sound outstandings (stage 1/stage 2) in order to maintain a prudent provisioning policy in an environment marked by economic prospects less favorable and in particular the rise in inflation and interest rates.

The cost of risk (expressed in basis points on the average of outstandings at the beginning of the period for the four quarters preceding the closing, including operating leases) thus stands at 28 basis points for the year 2022 compared to 13 basis points in 2021.

- In **French Retail Banking**, the cost of risk is up to 20 basis points in 2022 compared to 5 basis points in 2021. This NCR includes an allocation of 4 bps on sound outstandings (compared to the stage 1/stage 2 recovery of -7bp in 2021).
- At 52 basis points in 2022 (compared to 38 basis points in 2021), the cost of risk of the **International Retail Banking and Financial Services** division increased despite a lower NCR on defaulted outstandings (internship 3) due to an allocation of 15 base points on stage 1/stage 2.
- The cost of risk for **Global Banking and Investor Solutions** posted a level of 23 basis points (compared to 4 basis points in 2021), reflecting a sharp rise in the cost of risk on performing loans (stage 1/ stage 2) at 20 bp, while the NCR on defaulted outstandings remains very moderate (4 bp against 7 bp in 2021).

Asset quality

TABLE 24: ASSET QUALITY

(In EURbn)	31.12.2022	31.12.2021
Performing loans	554.4	543.9
inc. Stage 1 book outstandings(1)	*494.2*	*479.9*
inc. Stage 2 book outstandings	*43.6*	*43.5*
Non-performing loans	15.9	16.5
inc. Stage 3 book outstandings	*15.9*	*16.5*
Total gross book outstandings*	570.3	560.4
GROUP GROSS NON PERFORMING LOANS RATIO*	**2.8%**	**2.9%**
Provisions on performing loans	3.2	2.8
inc. Stage 1 provisions	*1.0*	*1.1*
inc. Stage 2 provisions	*2.1*	*1.7*
Provisions on non-performing loans	7.7	8.4
inc. Stage 3 provisions	*7.7*	*8.4*
Total provisions	10.9	11.2
GROUP GROSS NON-PERFORMING LOANS RATIO (PROVISIONS ON NON-PERFORMING LOANS/NON-PERFORMING LOANS)	**48%**	**51%**

(1) Data restated excluding loans at fair value through profit or loss which are not eligible to IFRS 9 provisioning.

** Figures calculated on on-balance sheet customer loans and advances, deposits at banks and loans due from banks, finance leases, excluding loans and advances classified as held for sale, cash balances at central banks and other demand deposits, in accordance with the EBA/ITS/2019/02 Implementing Technical Standards amending Commission Implementing Regulation (EU) No 680/2014 with regard to the reporting of financial information (FINREP). The NPL rate calculation was modified in order to exclude from the gross exposure in the denominator the net accounting value of the tangible assets for operating lease. Performing and non-performing loans include loans at fair value through profit or loss which are not eligible to IFRS 9 provisioning and so not split by stage. Historical data restated.*

Restructured debt

Audited I For the Societe Generale group, "restructured" debt refers to loans with amounts, terms or financial conditions contractually modified due to the borrower's financial difficulties (whether these financial difficulties have already occurred or will definitely occur unless the debt is restructured). Societe Generale aligns its definition of restructured loans with the EBA one.

Restructured debt does not include commercial renegotiations involving customers for whom the Bank has agreed to renegotiate the debt in order to maintain or develop a business relationship, in accordance with credit approval rules and without any financial difficulties.

Any situation leading to a credit restructuring and involving a loss of value greater than 1% of the original debt or in which the customer's ability to repay the debt according to the new schedule appears compromised must result in the classification of the customer concerned in default. Basel and the classification of outstandings as impaired, in accordance with the EBA directives on the application of the definition of default according to Article 178 of European Regulation No. 575/2013. In this case, customers are kept in default as long as the Bank is uncertain about their ability to honor their future commitments and at least for one year from the date of the restructuring. In other cases, an analysis of the customer's situation makes it possible to estimate his ability to repay according to the new schedule. If this ability is proved, the client can be remained in performing loans. Otherwise, the customer is also transferred to Basel default.

The total balance sheet amount of restructured debt at 31 December 2022 mainly corresponds to loans and receivables at amortised cost for an amount of EUR 6.9 billion. ▲

TABLE 25: RESTRUCTURED DEBT

(In EURm)	31.12.2022	31.12.2021
Non-performing restructured debt	2,645	3,342
Performing restructured debt	4,779	5,424
GROSS AMOUNT OF RESTRUCTURED DEBT(1)	**7,425**	**8,765**

(1) Composed of EUR 6.9 billion carried on the balance sheet and EUR 0.5 billion as off-balance sheet at 31 December 2022.

4.6 COUNTERPARTY CREDIT RISK

Audited I Counterparty credit risk (CCR) is driven by market transactions. Counterparty credit risk is therefore a multidimensional risk, combining credit and market risks, in the sense that the future value of the exposure to a counterparty and its credit quality are uncertain and variable in time (credit component), whilst also being impacted by changes in market parameters (market component). It can be broken down into the following categories:

- default risk: it corresponds to the replacement risk to which the Societe Generale Group is exposed in the event of a counterparty's failure to comply with its payment obligations. In this case, following the counterparty's default SG must replace this transaction with a new transaction. Potentially, this must be done under stressed market conditions, with reduced liquidity and sometimes even facing a Wrong Way Risk (WWR);
- Credit Valuation Adjustment (CVA) risk: it corresponds to the variability of the value adjustment due to counterparty credit risk, which is the market value of the CCR for derivatives and repos, that is an adjustment to the transaction price factoring in the credit quality of the counterparty. It is measured as the difference between the price of a contract with a risk-free counterparty and the price of the same contract factoring in the counterparty's default risk;
- risk on CCPs : it is related to the default of another clearing member of the central clearing house, which could result in losses for the Group on its contribution to the default fund.

Transactions involving counterparty credit risk include delivered pensions, securities lending and borrowing, and derivative contracts, whether they are dealt with principal activity or on behalf of third parties (agency activities or client clearing) in the context of market activites. ▲

4.6.1 DETERMINING LIMITS AND MONITORING FRAMEWORK

4.6.1.1 Main principles

Audited I Counterparty credit risk is framed through a set of limits that reflect the Group's appetite for risk.

Counterparty credit risk management mainly relies on dedicated first and second lines of defence as described below:

- the first lines of defence (LoD1) notably include the business lines that are subject to counterparty credit risk, the Primary Client Responsibility Unit that is in charge of handling the overall relationship with the client and the group to which it belongs, dedicated teams within the Global Banking and Advisory and the Global Markets Business Units responsible for monitoring and managing the risks within their respective scope of activities;
- the Risk Department acts as a second line of defence (LoD2) through the setup of a counterparty credit risk control system, which is based on standardised risk measures, to ensure the permanent and independent monitoring of counterparty credit risks.

The fundamental principles of limit granting policy are:

- dedicated LoD1 and LoD2 must be independent of each other;
- the Risk Department has a division dedicated to counterparty credit risk management in order to monitor and analyse the overall risks of counterparties whilst taking into account the specificities of counterparties;
- a system of delegated authorities, mainly based on the internal rating of counterparties, confers decision-making powers to LoD1 and LoD2;
- the limits and internal ratings defined for each counterparty are proposed by LoD1 and validated by the dedicated LoD2[(1)]. The limits may be set individually, at the counterparty level, or globally through framing a (sub)set of counterparties (for example: supervision of stress test exposures).

These limits are subject to annual or *ad hoc* reviews depending on he needs and changing market conditions.

A dedicated team within the Risk Department is in charge of production, reporting and controls on risk metrics, namely:

- ensuring the completeness and reliability of the risk calculation by taking into account all the transactions booked by the transaction processing department;
- producing daily certification and risk indicator analysis reports;
- controlling compliance with defined limits, at the frequency of metrics calculation, most often on a daily basis: breaches of limits are reported to Front Office and dedicated LoD2 for remediation actions.

In addition, a specific monitoring and approval process is implemented for the most sensitive counterparties or the most complex categories of financial instruments.

4.6.1.2 Comitology

While not a substitute for CORISQ or for the Risk Committee of the Board of Directors (see the section on Risk management governance), the Counterparty Credit Risk Committee (CCRC) closely monitors counterparty credit risk through:

- a global overview on exposure and counterparty credit risk metrics such as the global stress tests, the Potential Future Exposure PFE, etc., as well as focuses on specific activities such as collateralised financing, or agency business;

(1) For Hedge Funds and PTG (Proprietary Trading Group) counterparties, the rating proposal is delegated to LoD2.

- dedicated analysis on one or more risks or customer categories or frameworks or in case of identification of emerging risk areas.

This Committee, chaired by the Risk Department on a monthly basis, brings together representatives from the Market Activities and the Global Banking and Advisory Business Units, but also departments that, within the risk management function, are in charge of monitoring counterparty credit risks on market transactions and credit risk. The CCRC also provides an opinion on the changes to the risk frameworks within its authority. The CRCC also identifies key CCR topics that need to be escalated to the management.

4.6.1.3 Replacement risk

The Group frames the replacement risks by limits that are defined by credit analysts and validated by LoD2 based on the Group's risk appetite.

The limits are defined at the level of each counterparty and then aggregated at the level of each client group, each category of counterparties and finally consolidated at the entire Societe Generale Group portfolio level.

The limits used for managing counterparty credit risk are:

- defined at the counterparty level;
- consolidated across all products types authorised with the counterparty;
- established by maturity buckets to control future exposure using the Potential Future Exposure (PFE) measure also known as CVaR within Societe Generale;
- calibrated according to the credit quality and the nature of the counterparty, the nature/maturity of the financial instruments contemplated (FX transactions, repos transactions, security lending transactions, derivatives, etc.), and the economic understanding, the contractual legal framework agreed and any other risk mitigants.

The Group also considers other measures to monitor replacement risk:

- a multifactor stress test on all counterparties, which allows to holistically quantify the potential loss on market activities following market movements which could trigger a wave of defaults on these counterparties;
- a set of single-factor stress tests to monitor the general wrong-way risk (see section 4.6.3.3 on Wrong Way Risk).

4.6.1.4 CVA (Credit Valuation Adjustment) risk

In addition to the replacement risk, the CVA (Credit Valuation Adjustment) measures the adjustment of the value of the Group's derivatives and repos portfolio in order to take into account the credit quality of the counterparties facing the Group (see section 4.6.3.2 *"Credit Valuation Adjustment"*).

Positions taken to hedge the volatility of the CVA (credit, interest rate or equity instruments) are monitored through:

- sensitivity limits;
- stress test limits: scenarios representative of the market risks impacting the CVA (credit spreads, interest rates, exchange rates and equity) are applied to carry out the stress test on CVA.

The different indicators and the stress tests are monitored on the net amount (the sum of the CVA exposure and of their hedges).

4.6.1.5 Risk on central counterparties

Clearing of transactions is a common market practice for SG, notably in compliance with the EMIR (European Market Infrastructure Regulation) regulations in Europe and the DFA (Dodd-Frank Act) in the United States, which require that the most standardised over-the-counter transactions be compensated *via* clearing houses approved by the authorities and subject to prudential regulation.

As a member of the clearing houses with which it operates, the Group contributes to their risk management framework through deposits into the defaults funds, in addition to margin calls.

The counterparty credit risk stemming from the clearing of derivatives and repos with central counterparties (CCP) is subject to a specific framework on:

- initial margins, both for house and client activities (client clearing);
- the Group's contributions to the CCP default funds (guarantee deposits);
- a stress test defined to capture the impact of a scenario where a major CCP member should default. ▲

See table "EAD and RWA on central counterparties" of section 4.6.3.4 *"Quantitative Information"* for more information.

4.6.2 MITIGATION OF COUNTERPARTY CREDIT RISK ON MARKET TRANSACTIONS

Audited I The Group uses various techniques to reduce this risk:

- the signing, in the most extensive way possible, of close-out netting agreements for over-the-counter (OTC) transactions and Securities Financing Transactions (SFT);
- the collateralisation of market operations, either through clearing houses for eligible products (listed products and certain of the more standardised OTC products), or through a bilateral margin call exchange mechanism which covers both current exposure (variation margins) but also future exposure (initial margins).

4.6.2.1 Close-out netting agreements

Societe Generale's standard policy is to conclude master agreements including provisions for close-out netting.

These provisions allow on the one hand the immediate termination (close out) of all transactions governed by these agreements when one of the parties defaults, and on the other hand the settlement of a net amount corresponding to the total value of the portfolio, after netting of mutual debts and claims. This balance may be the subject of a guarantee or collateralisation. It results in a single net claim owed by or to the counterparty.

In order to reduce the legal risk associated with documentation and to comply with key international standards, the Group documents these agreements under the main international standards as published by national or international professional associations such as International Swaps and Derivatives Association (ISDA), International Capital Market Association (ICMA), International Securities Lending Association (ISLA), French Banking Federation (FBF), etc.

These contracts establish a set of contractual terms generally recognised as standard and give way to the modification or addition of more specific provisions between the parties in the final contract, for example regarding the triggering events. This standardisation reduces implementation times and secures operations. The clauses negotiated by clients outside the bank's standards are approved by the decision-making bodies in charge of the master agreements standards – Normative Committee and/or Arbitration Committee – made up of representatives of the Risk Division, the Business Units, the Legal Division and other decision-making departments of the bank. In accordance with regulatory requirements, the clauses authorising global close-out netting and collateralisation are analysed by the bank's legal departments to ensure that they are enforceable under the legal provisions applicable to clients.

4.6.1.2 Collateralisation

Most of over-the-counter transactions are collateralised. There are two types of collateral exchanges:

- initial margin (IM) or Independent Amount (IA[1]): an initial amount of collateral aiming at covering potential future exposure, *i.e.* the unfavourable change in the Mark-to-Market of positions in the time period between the last collection of margins and the liquidation of positions following the counterparty default;
- variation margin (VM): collateral collected to cover current exposure arising from Mark-to-Market changes, used as an approximation of the actual loss resulting from the default of one of the counterparties.

All aspects of the margining regime are defined in collateral arrangements, such as credit support annexes (CSA[2]). The main features defined are:

- the scope covered (*i.e.* the nature of transactions allowed);
- the eligible collateral and the applicable haircut: main types of collateral exchanged are cash or high-quality and liquid assets according to the Group's policy, and are subject to a haircut, which is the valuation percentage applicable to each type of collateral, based on liquidity and price volatility of the underlying during both normal and stressed market conditions;
- the timing and frequency of the calculation of the margin call and exchanges, usually daily;
- the margin call thresholds if not under regulatory obligation;
- the Minimum Transfer Amount (MTA).

In addition, specific parameters or optional features can be defined depending on the type of counterparty/transaction, such as an additional guarantee amount (flat-rate increase of the exposure allowing the party making a margin call to be "over-collateralised"), or rating-dependent clauses, typically mutual in nature, where additional collateral is requested in case of a party's rating downgrade.

The Group monitors given and received collateral exchanges. In case of discrepancies between the parties with respect to margin call amounts, dedicated teams from the Operations and the Risk Departments are in charge of analysing the impacted transactions to ensure they are correctly valued and of addressing the issue.

BILATERAL COLLATERAL EXCHANGE

The initial margin, historically very rare except with hedge funds, was generalised by EMIR and DFA regulations which introduced the mandatory use of master agreements and related CSA, prior to or when entering into an uncleared OTC derivatives transactions. It is now mandatory for the Group to exchange IM and VM for non-cleared OTC derivatives transactions with a large number of its counterparties (its financial counterparties and some non-financial counterparties above certain thresholds defined by the regulation, with compliance dates depending on the volume of transactions).

The Regulatory Technical Standards (RTS) on Initial Margin Model Validation (IMMV) under EMIR allows counterparties subject to mandatory bilateral collateral exchange requirements to waive these rules in certain circumstances. The Group has incorporated a waiver application process for intra-group entities into its risk management policies. The eligibility criteria for this waiver are framed and monitored as required by the Delegated Regulation.

CLEARING HOUSES

EMIR and DFA regulations have also required that the most standard over-the-counter derivatives transactions be compensated through clearing houses. The Group thus compensates its own operations (principal activity), but also client clearing activities (agency-type activity), which are subject to systematic margin calls to mitigate counterparty credit risk (customers posting daily variation margins and initial margins to Societe Generale, in order to cover current exposure and future exposure). ▲

OTHER MEASURES

In addition to margin requirements for some counterparties or mandatory clearing for the most standardised derivatives transactions, DFA and EMIR provide for an extensive framework for the regulation and transparency of OTC derivatives markets, such as reporting of OTC derivatives, timely confirmation or trade acknowledgement.

(1) IA (Independent Amount) is the same concept as initial margin, but applies to different perimeters (OTC swaps not cleared for IA).
(2) The Credit Support Annex (CSA) is a legal document under ISDA contract that regulates the management of collateral between two counterparties.

4.6.3 COUNTERPARTY CREDIT RISK MEASURES

4.6.3.1 Replacement risk

Audited I The measure of replacement risk is based on an internal model that determines the Group's exposure profiles. As the value of the exposure to a counterparty is uncertain and variable over time, we estimate the potential future replacement costs over the lifetime of the transactions. ▲

PRINCIPLES OF THE MODEL

The future fair value of market transactions with each counterparty is estimated from Monte Carlo models based on a historical analysis of market risk factors.

The principle of the model is to represent the possible future financial markets conditions by simulating the evolutions of the main risk factors to which the institution's portfolio is sensitive. For these simulations, the model uses different diffusion models to account for the characteristics inherent in the risk factors considered and uses a 10-year history for calibration.

The transactions with the various counterparties are then revalued according to these different scenarios at the different future dates until the maturity of the transactions, taking into account the terms and conditions defined in the contractual legal framework agreed and the credit mitigants, notably in terms of netting and collateralisation only to the extent we believe that the credit mitigants provisions are legally valid and enforceable.

The distribution of the counterparty exposures thus obtained allows the calculation of regulatory capital for counterparty credit risk and the economic monitoring of positions.

The Risk Department responsible for Model Risk Management at Group level, assesses the theoretical robustness (review of the design and development quality), the compliance of the implementation, the suitability of the use of the model and continuous monitoring of the relevance of the model over time. This independent review process ends with (i) a report that describes the scope of the review, the tests carried out, the results of the review, the conclusions or recommendations and (ii) review and approval Committees. This model review process gives rise to (i) recurring reports to the Risk Management Department within the framework of various Committees and processes (Group Model Risk Management Committee, Risk Appetite Statement/Risk Appetite Framework, monitoring of recommendations, etc.) and (ii) a yearly report to the Board of Directors (CORISQ).

REGULATORY INDICATOR

Audited I With respect to the calculation of capital requirements for counterparty credit risk, the ECB, following the Targeted Review of Internal Models, has renewed the approval for using the internal model described above to determine the Effective Expected Positive Exposure (EEPE) indicator.

For products not covered by the internal model as well as for entities in the Societe Generale Group that have not been authorised by the supervisor to use the internal model, the Group uses the market-price valuation method for derivatives(1) and the general financial security-based method for securities financing transactions (SFT(2)).

The effects of compensation agreements and collateralisation are taken into account either by their simulation in the internal model when such credit risk mitigant or guarantees meet regulatory criteria, or by applying the rules as defined in the market-price valuation method or the financial security-based method, by subtracting the value of the collateral.

These exposures are then weighted by rates resulting from the credit quality of the counterparty to compute the Risk Weighted Assets (RWA). These rates can be determined by the standard approach or the advanced approach (IRBA).

As a general rule, when EAD is modelled in EEPE and weighted according to IRB approach, there is no adjustment of the LGD according to the collateral received as it is already taken into account in the EEPE calculation. ▲

The RWA breakdown for each approach is available in the "Analysis of Counterparty Credit Risk Exposure by Approach" table in Section 4.6.3.4 *"Quantitative Information"*.

ECONOMIC INDICATOR

For the economic monitoring of positions, Societe Generale relies mainly on a maximum exposure indicator determined from the Monte Carlo simulation, called internally Credit Value-at-Risk (CVaR) or PFE (Potential Future Exposure). This is the maximum amount of loss that could occur after eliminating 1% of the most adverse occurrences. This indicator is calculated at different future dates, which are then aggregated into segments, each of them being framed by limits.

The Group has also developed a set of stress test scenarios to determine the exposure that would result from changes in the fair value of transactions with all its counterparties in the event of an extreme shock affecting the market parameters.

4.6.3.2 Credit Valuation Adjustment

MAIN PRINCIPLES

The CVA (Credit Valuation Adjustment) is an adjustment to marked-to-market of the derivatives and repos portfolio to take into account the credit quality of each counterparty facing the Group in the valuation. This adjustment is equivalent to the counterparty credit risk hedging cost usually based on in the Credit Default Swap (CDS) market.

For a specific counterparty, the CVA is determined on the basis of:

- the positive expected exposure to the counterparty, which is the average of the positive hypothetical future exposure values for a transaction, or a group of transactions, weighted by the probability that a default event will occur. It is mainly determined using risk neutral Monte Carlo simulations of risk factors that may affect the valuation of the derivatives transactions. The transactions are revalued through time according to the different scenarios, taking into account the terms and conditions defined in the contractual legal framework agreed, notably in terms of netting and collateralisation (*i.e.* that transactions with appropriate credit mitigants will generate lower expected exposure compared to transactions without credit mitigants);

(1) In this method, the EAD (Exposure At Default) relating to the Bank's counterparty credit risk is determined by aggregating the positive market values of all transactions (replacement cost) supplemented by an add-on factor.
(2) Securities Financing Transactions.

- the probability of default of the counterparty, which is linked to the level of CDS spreads;
- the amount of losses in the event of default (LGD – Loss Given Default taking into account the recovery rate).

The Group calculates this adjustment for all counterparties which are not subject to a daily margin call or for which collateral only partially covers the exposure.

CAPITAL REQUIREMENT FOR CVA RISK

The financial institutions are subject to the calculation of a capital requirement under the CVA, to cover its variation over ten days. The scope of counterparties is reduced to financial counterparties as defined in EMIR (European Market Infrastructure Regulation) or to certain Corporates that may use derivatives beyond certain thresholds and for purposes other than hedging.

The CVA charge is determined by the Group mainly using the advanced method:

- the positive expected exposure to the counterparty is mainly determined using the internal model described in section 4.6.3.1, which estimates the future exposure profiles to a counterparty, taking into account counterparty credit risk mitigants;
- the VaR and the Stressed VaR on CVA are determined using a similar methodology to the one developed for the calculation of the market VaR (see market risk chapter). This method consists of an "historical" simulation of the change in the CVA due to fluctuations in the credit spreads observed on the counterparties in portfolio, with a confidence interval of 99%. The calculation is made on the credit spreads variation observed, on the one hand, over a one-year rolling period (VaR on CVA), and, on the other hand, over a fixed one-year historical window corresponding to the period of greatest tension in terms of credit spreads (stressed VaR on CVA);
- the capital charge is the sum of two elements: VaR on CVA and Stressed VaR on CVA multiplied by a coefficient set by the regulator, specific to each bank.

The positions not taken into account in the advanced method are subject to a capital charge determined through the standard method by applying a normative weighting factor to the product of the EAD (Exposure At Default) by a maturity calculated according to the rules defined by the CRR (Capital Requirement Regulation); see the "Transactions subject to own funds requirements for CVA risk" table in Section 4.6.3.4 *"Quantitative Information"* for the breakdown of CVA-related RWA between advanced and standard methods.

CVA RISK MANAGEMENT

The management of this exposure and of this regulatory capital charge led the Bank to purchase hedging instruments such as Credit Default Swap (CDS) from large credit institutions on certain identified counterparties or on indices composed of identifiable counterparties. In addition to reducing credit risk, it decreases the variability of the CVA and the associated capital amounts resulting from fluctuations in counterparty credit spreads.

The CVA desk (or the Societe Generale Group) also handles instruments for hedging interest rate or foreign exchange risks, which helps to limit the variability of the CVA's share from positive exposure.

4.6.3.3 Unfavorable correlation risk (wrong-way risk)

Wrong-way risk is the risk of the Group's exposure to a counterparty increasing significantly, combined with a simultaneous increase in the probability of the counterparty defaulting.

There are two different cases:

- general wrong-way risk arises when the likelihood of default by counterparties is positively correlated with general market risk factors;
- specific wrong-way risk arises when future exposure to a specific counterparty is positively correlated with the counterparty's probability of default due to the nature of the transaction with the counterparty.

Specific wrong-way risk, in the case of a legal link between the counterparty and the underlying of a transaction concluded with the counterparty, is subject to dedicated regulatory capital requirements, calculated on the perimeter of transactions carrying such risk. Furthermore, for counterparties subject to such a specific risk, the Potential Future Exposure (PFE) is also increased, so that the transactions allowed by the limits in place will be more constrained than in the absence of specific risk.

The general wrong-way risk is controlled *via* a set of stress tests applied to transactions made with a given counterparty, based on scenarios common with the market stress tests. This set-up is based on:

- a quarterly analysis of stress tests on all counterparties (financial institutions, corporates, sovereigns, hedge funds and proprietary trading groups) for principal and agency (client clearing) businesses, allowing to understand the most adverse scenarios related to a joint deterioration in the quality of counterparties and the associated positions;
- a weekly monitoring of dedicated single-factor stress tests for hedge fund counterparties and Proprietary Trading Groups, subject to limits at the counterparty level.

4.6.3.4 Quantitative Information

TABLE 26: COUNTERPARTY CREDIT RISK EXPOSURE, EAD AND RWA BY EXPOSURE CLASS AND APPROACH

Counterparty credit risk is broken down as follows:

	31.12.2022								
(In EURm)	IRB			Standard			Total		
Exposure classes	**Exposure**	**EAD**	**RWA**	**Exposure**	**EAD**	**RWA**	**Exposure**	**EAD**	**RWA**
Sovereign	44,698	44,696	235	2,551	2,551	33	47,249	47,247	267
Institutions	18,979	18,994	3,574	31,948	32,019	613	50,927	51,013	4,187
Corporates	55,555	55,543	13,027	2,972	2,901	2,808	58,527	58,444	15,835
Retail	68	68	7	21	21	14	89	89	21
Other	426	426	134	5,573	5,571	1,054	5,999	5,997	1,188
TOTAL	**119,726**	**119,726**	**16,976**	**43,065**	**43,063**	**4,521**	**162,791**	**162,789**	**21,498**

	31.12.2021								
(In EURm)	IRB			Standard			Total		
Exposure classes	**Exposure**	**EAD**	**RWA**	**Exposure**	**EAD**	**RWA**	**Exposure**	**EAD**	**RWA**
Sovereign	24,471	24,511	395	177	177	4	24,648	24,688	399
Institutions	16,653	16,727	3,664	38,068	38,363	960	54,721	55,090	4,624
Corporates	56,698	56,583	14,554	4,441	4,147	4,051	61,139	60,730	18,605
Retail	83	83	8	23	23	14	106	106	21
Other	7	7	2	4,295	4,295	1,022	4,302	4,302	1,023
TOTAL	**97,912**	**97,912**	**18,622**	**47,004**	**47,004**	**6,051**	**144,916**	**144,916**	**24,673**

The tables above feature amounts excluding the CVA (Credit Valuation Adjustment) which represents EUR 2.8 billion of risk-weighted assets (RWA) at 31 December 2022 (*vs.* EUR 2.8 billion at 31 December 2021).

TABLE 27: ANALYSIS OF COUNTERPARTY CREDIT RISK EXPOSURE BY APPROACH

	31.12.2022							
(In EURm)	Replacement cost (RC)	Potential future exposure (PFE)	EEPE	Alpha used for computing regulatory exposure value	Exposure value pre-CRM	Exposure value post-CRM	Exposure value	RWA
Original Exposure Method (for derivatives)	-	-		1	-	-	-	-
Simplified SA-CCR (for derivatives)	-	-		1	-	-	-	-
SA-CCR (for derivatives)	1,938	35,665		1	92,752	52,644	52,645	6,649
IMM (for derivatives and SFTs)			38,283	2	444,207	63,311	63,348	12,381
of which securities financing transactions netting sets			*18,727*		*370,235*	*29,089*	*29,089*	*2,137*
of which derivatives and long settlement transactions netting sets			*19,493*		*72,565*	*34,113*	*34,151*	*10,239*
of which from contractual cross-product netting sets			*62*		*1,407*	*109*	*109*	*5*
Financial collateral simple method (for SFTs)					-	-	-	-
Financial collateral comprehensive method (for SFTs)					23,324	11,291	11,291	1,050
VaR for SFTs					-	-	-	-
TOTAL					**560,282**	**127,246**	**127,284**	**20,080**

	31.12.2021							
(In EURm)	Replacement cost (RC)	Potential future exposure (PFE)	EEPE	Alpha used for computing regulatory exposure value	Exposure value pre-CRM	Exposure value post-CRM	Exposure value	RWA
Original Exposure Method (for derivatives)	-	-		1	-	-	-	-
Simplified SA-CCR (for derivatives)	-	-		1	-	-	-	-
SA-CCR (for derivatives)	2,027	20,727		1	67,282	31,808	31,794	9,304
IMM (for derivatives and SFTs)			35,417	2	472,121	62,416	62,322	13,088
of which securities financing transactions netting sets			*16,892*		*395,150*	*28,067*	*28,067*	*2,142*
of which derivatives and long settlement transactions netting sets			*18,453*		*76,847*	*34,217*	*34,123*	*10,946*
of which from contractual cross-product netting sets			*71*		*124*	*132*	*132*	-
Financial collateral simple method (for SFTs)					-	-	-	-
Financial collateral comprehensive method (for SFTs)					27,145	11,245	11,245	994
VaR for SFTs					-	-	-	-
TOTAL					**566,548**	**105,470**	**105,361**	**23,385**

TABLE 28: EXPOSURES TO CENTRAL COUNTERPARTIES

	31.12.2022		31.12.2021	
(In EURm)	**Exposure value**	**RWA**	**Exposure value**	**RWA**
Exposures to QCCPs (total)		**918**		**1,273**
Exposures for trades at QCCPs (excluding initial margin and default fund contributions), of which:	7,443	149	7,083	142
(i) OTC derivatives	2,190	44	759	15
(ii) Exchange-traded derivatives	4,025	81	5,866	117
(iii) SFTs	1,022	20	457	9
(iv) Netting sets where cross-product netting has been approved	206	4	-	-
Segregated initial margin	18,063		22,466	
Non-segregated initial margin	4,002	80	5,555	111
Pre-funded default fund contributions	3,199	688	3,992	1,020
Unfunded default fund contributions	-	-	-	-
Exposures to non-QCCPs		-		-
Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions), of which:	-	-	-	-
(i) OTC derivatives	-	-	-	-
(ii) Exchange-traded derivatives	-	-	-	-
(iii) SFTs	-	-	-	-
(iv) Netting sets where cross-product netting has been approved	-	-	-	-
Segregated initial margin	-		-	
Non-segregated initial margin	-	-	-	-
Pre-funded default fund contributions	-	-	-	-
Unfunded default fund contributions	-	-	-	-

TABLE 29: TRANSACTIONS SUBJECT TO OWN FUNDS REQUIREMENTS FOR CVA RISK

	31.12.2022		31.12.2021	
(In EURm)	**Exposure value**	**RWA**	**Exposure value**	**RWA**
Total transactions subject to the Advanced Method	36,947	2,222	33,066	2,218
(i) VaR component (including the 3×multiplier)		329		193
(ii) Stressed VaR component (including the 3×multiplier)		1,893		2,025
Transactions subject to the Standardised Method	8,665	582	6,812	589
Transactions subject to the Alternative approach (based on Original Exposure Method)	-	-	-	-
Total transactions subject to own funds requirements for CVA risk	**45,612**	**2,805**	**39,878**	**2,807**

4.7 MARKET RISK

Audited I Market risk is the risk of loss of value on financial instruments arising from changes in market parameters, the volatility of these parameters, and the correlations between them. These parameters include, but are not limited to, exchange rates, interest rates, the price of securities (equities or bonds), commodities, derivatives and other assets. ▲

4.7.1 ORGANISATION OF MARKET RISK MANAGEMENT

Main functions

Audited I Although primary responsibility for managing risk exposure relies on the front office managers, the supervision system comes under the Market Risk Department of the Risk Department, which is independent from the businesses.

The main missions of this department are:

- the definition and proposal of the Group's market risk appetite;
- the proposal of appropriate market risk limits by Group activity to the Group Risk Committee (CORISQ);
- the assessment of the limit requests submitted by the different businesses within the framework of the overall limits authorised by the Board of Directors and General Management, and based on the use of these limits;
- the permanent verification of the existence of an effective market risk monitoring framework based on suitable limits;
- the definition of the indicators used to monitor market risk;
- the daily calculation and certification of the market risk indicators, of the P&L resulting from market activities, based on formal and secure procedures, and then of the reporting and the analysis of these indicators;
- the daily monitoring of the limits set for each activity.

In order to perform its tasks, the department also defines the architecture and the functionalities of the information system used to produce the risk and P&L indicators for market transactions, and ensures it meets the needs of the different businesses and of the Market Risk Department. ▲

This department contributes to the detection of possible rogue trading operations through a monitoring mechanism based on alert levels (on gross nominal value of positions for example) applied to all instruments and desks.

Governance

Market risks oversight is provided by various Committees at different levels of the Group:

- the Risk Committee of the Board of Directors(1) is informed of the Group's major market risks; in addition, it issues a recommendation on the most substantial proposed changes in terms of market risk measurement and framework (after prior approval by the CORISQ); this recommendation is then referred to the Board of Directors for a decision;
- the Group Risk Committee(2) (CORISQ), chaired by the Chief Executive Officer of the Group (DGLE), is regularly informed of Group-level market risks. Moreover, upon a proposal from the Risk Department, it validates the main choices with regard to market risk measurement, as well as the key developments on the architecture and implementation of the market risk framework at Group level. The global market risk limits with a Board or DGLE delegation level are reviewed in CORISQ at least twice a year;
- the market risks related to the Global Markets Division are reviewed during the Market Risk Committee(3) (MRC) led by the Market Risk Department and co-chaired by the Risk Department and by the Global Markets Division. This Committee provides information on risk levels for the main risk indicators as well as for some specific activities pointed out depending on market or business driven events. It also provides an opinion on the market risk framework changes falling under the remit of the Risk Department and Global Markets Division. Thus, the global market risk limits with a MARK/DIR – RISQ/DIR delegation level are reviewed in MRC at least twice a year.

During these Committees, the market activities P&L and several metrics for monitoring market risks are reported:

- stress test measurements: Global Stress Test on market activities and Market Stress Test;
- regulatory metrics: Value-at-Risk (VAR) and Stressed Value-at-Risk (SVAR).

In addition to these Committees, detailed and summary market risk reports, produced on a daily, weekly, monthly or quarterly basis, either related to various Group levels or geographic areas, are sent to the relevant business line and risk function managers.

In terms of governance, within the Market Risk Department, the main functional and transversal subjects are dealt with during Committees organised by value chains (market risk, P&L, etc.). These Committees are decision-making bodies, composed of senior representatives from each relevant Department teams and regions.

(1) The Risk Committee met 10 times in 2022, covering topics related to market activities.
(2) Seven CORISQ meetings dedicated to market activities took place in 2022.
(3) The Market Risk Committee met 11 times in 2022.

4.7.2 MARKET RISK MONITORING PROCESS

Market risk appetite

Audited I The business development strategy of the Group for market activities is primarily focused on meeting clients' needs, with a comprehensive range of products and solutions. The risk resulting from these market activities is strictly managed through a set of limits for several indicators:

- the Value-at-Risks (VaR) and stressed Value-at-Risks (sVaR): these global indicators are used for market risk calculations for RWA and for the day-to-day monitoring of the market risks incurred by the Group within the scope of its trading activities;
- stress test measurements, based on decennial shock-type indicators, which make it possible to restrict the Group's exposure to systemic risk and exceptional market shocks. These measurements can be global, multi-risk factor (based on historic or hypothetical scenarios), by activity or risk factor in order to take into account extreme risks on a specific market, or event-driven, to temporarily monitor a particular situation;
- sensitivity and nominal indicators used to manage the size of positions:
  - sensitivities are used to monitor the risk incurred locally on a given type of position (*e.g.* sensitivity of an option to changes in the underlying asset),
  - while nominal indicators are used for significant positions in terms of risk;
- additional indicators such as concentration risk or holding period, maximum maturity, etc. ▲

The Market Risk Department is responsible for the assessment and validation of the limit requests submitted by the different business lines. These limits ensure that the Group complies with the market risk appetite approved by the Board of Directors.

Determining and monitoring limits

The choice and calibration of these limits ensure the operational transposition of the Group's market risk appetite through its organisation:

- these limits are allocated at various levels of the Group's structure and/or by risk factor;
- their calibration is determined using a detailed analysis of the risks related to the portfolio managed. This analysis may include various elements such as market conditions, specifically liquidity, position maneuverability, risk/rewards analysis, ESG criteria, etc.;
- regular reviews make it possible to manage risks according to the prevailing market conditions;
- specific limits, or even bans, may be put in place to manage risks for which the Group has little or no risk appetite.

The desk mandates and Group policies stipulate that the traders must have a sound and prudent management of positions and must respect the defined frameworks. The allowed transactions, as well as risk hedging strategies, are also described in the desk mandates. The limits set for each activity are monitored daily by the Market Risk Department. This continuous monitoring of the market risk profile is the object of regular discussions between the risk and business teams, further to which various risk hedging or mitigation initiatives may be taken by the front office in order to remain within the defined limits. In the event of a breach of the risk framework, and in compliance with the limits follow-up procedure, the front office must detail the reasons, and take the necessary measures to return within the defined framework, or otherwise request a temporary or permanent increase of limit if the client's request and if market conditions justify such a course of action.

In addition to the governance structure in place between the various departments of the Risk function and business lines, the monitoring of limits usage, due to the products/solutions provided to clients and the market-making activities, also contributes to ensuring that market risk to which the Group is exposed are properly managed and understood.

4.7.3 MAIN MARKET RISK MEASURES

Stress test assessment

Audited I Societe Generale monitors its exposure using stress test simulations to take into account exceptional market disruptions.

A stress test estimates the loss resulting from an extreme change in market parameters over a period corresponding to the time required to unwind or hedge the positions affected.

Two major metrics are defined and used:

- the Global Stress Test on market activities, which estimates the losses linked to market risks, market/counterparty cross-risk, and dislocation and carry risk on exotic activities, that could arise simultaneously in the event of a severe but plausible systemic crisis. This stress test is modeled on five scenarios;
- the Market Stress Test, which focuses solely on market risks, applying the same scenarios as the Global Stress Test and additional scenarios corresponding to different market conditions.

The various scenarios for those stress tests are reviewed by the Risk Division on a regular basis. These reviews are presented during dedicated biannual Committees, chaired by the Market Risk Department and attended by economists and representatives of Societe Generale's trading activities. These Committees cover the following topics: changes in scenarios (introduction, removal, shock review), appropriate coverage of the risk factors by the scenarios, review of the approximations made in terms of calculation, correct documentation of the whole process. The delegation level needed to validate the changes in stress test methodology depends on the impact of the change in question.

The Global Stress Test on market activities limits and the Market Stress Test limits play a central role in the definition and the calibration of the Group's appetite for market risk: these indicators cover all activities and the main market risk factors and associated risks associated with a severe market crisis, this allows both to limit the overall amount of risk and to take into account any diversification effects.

This framework is complemented by stress-testing frameworks on four risk factors on which the Group has significant exposures, in order to reduce the overall risk appetite: equities, interest rates, credit spread and emerging markets.

GLOBAL STRESS TEST ON MARKET ACTIVITIES

The Global Stress Test on market activities is the main risk indicator used on this scope. It covers all the risks on market activities that would occur simultaneously in case of a severe, but plausible, market crisis. The impact is measured over a short period of time with an expected occurrence of once per decade. The Global Stress Test uses five market scenarios and has three components, each of which are considered in each of the five scenarios in order to ensure consistency within the same scenario:

- market risk;
- dislocation and carry risks on exotic activities related to concentration effects and crowded trades;
- market/counterparty cross-risks arising in transactions with weak counterparties (hedge funds and proprietary trading groups).

The Global Stress Test corresponds to the least favorable results arising from the five scenarios and their respective components.

Market risk component

It corresponds to:

- the results of the Market Stress Test(1) restricted to scenarios that could cause dislocation effects on market positions and default by weak counterparties. These scenarios all simulate a sharp fall in the equity markets and a widening in credit spreads which could trigger dislocation effects. Following the last review of the scenarios at the end of 2020, it was decided to use for the calculation of the stress test three theoretical scenarios (generalised (*i.e.* financial crisis scenario), eurozone crisis, general decline in risk assets) and two historical scenarios focusing respectively on the period of early October 2008 and early March 2020;
- the impact of the stress test scenario on CVA (Credit Value Adjustment) and FVA (Funding Value Adjustment) reserves, as their variations affect trading results.

Dislocation and carry risk component

Additional market risks to those assessed in the Market Stress Test can occur in market situation in which one or more participants – generally structured products sellers – have concentrated or crowded trades. Dynamic risk hedging strategies can cause larger market dislocations than those calibrated in the Market Stress Test, and these dislocations can extend beyond the shock timeline used due to an imbalance between supply and demand.

Equity, credit, fixed income, currency and commodity trading activities are regularly reviewed to identify these areas of risk and to define a scenario that takes into account the specific features of each activity and position. Each scenario associated with an identified area of risk is added to the market risk component if – and only if – it is compatible with the market scenario in question.

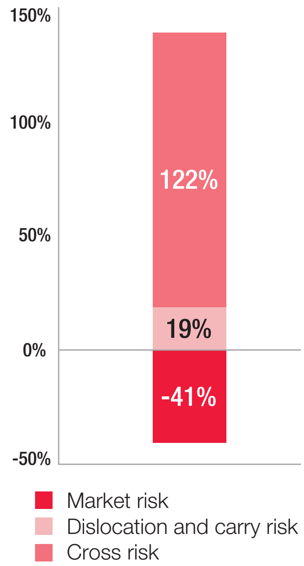
Market/counterparty cross-risk component on weak counterparties

Some counterparties may be significantly affected by a major crisis on the financial markets and their probability of default may increase. The third component of the Global Stress Test therefore aims to take into account this increased risk on certain types of weak counterparties (hedge funds and proprietary trading groups).

Four measurements are used:

- **the collateralised financing stress test:** this stress test focuses on collateralised financing activities and more specifically on weak counterparties. It applies a dislocation shock to several asset classes with the assumption of extremely tight liquidity conditions. Collateral and counterparty default rates are stressed concomitantly, taking into account any consanguinity with the collateral posted;
- **the adverse stress test on hedge funds and proprietary trading groups (PTG):** this stress test applies three pairs of stress scenarios to all market transactions generating replacement regarding this type of counterparty. Each set of scenarios consists of a short-term scenario (scenario derived from the Market Stress Test) applied to positions with margin calls, and a long-term scenario (whose shocks are generally more severe) for positions without margin calls. Stressed current exposures are weighted by the probability of default of each counterparty and by the loss given default (LGD), then aggregated;
- **the adverse stress test on products whose underlying is a hedge fund:** this type of underlying poses a risk of illiquidity in the event of a crisis, the purpose of this stress test is to estimate the corresponding potential loss on transactions with this type of underlying and presenting a "gap risk";
- **the Clearing House (CCP) Member stress test:** it estimates the potential loss in the event of a default of a CCP member of which Societe Generale is also a member. ▲

AVERAGE CONTRIBUTION OF THE COMPONENTS IN 2022 GLOBAL STRESS TEST ON MARKET ACTIVITIES



(1) *Measurement of the impact in the Net Banking Product in case of shocks to all risk factors (refer to description below).*

MARKET STRESS TEST

Audited I This metric focuses on market risk and estimates the loss resulting from shocks on the set of risk factors. This stress test is based on 11 scenarios[1] (four historical and seven hypothetical). The main principles are as follows:

- the scenario considered in the market stress test is the worst of the different scenarios defined;
- the shocks applied are calibrated on time horizons specific to each risk factor (the time horizon can range from five days for the most liquid risk factors to three months for the least liquid);
- risks are calculated every day for each of the Bank's market activities (all products together), using each of the historical and hypothetical scenarios.

Historical scenarios

This method consists of an analysis of the major economic crises that have affected the financial markets: changes in the prices of financial assets (equities, interest rates, exchange rates, credit spreads, etc.) during each of these crises have been analysed in order to define scenarios for potential variations in these main risk factors which, when applied to the Bank's trading positions, could generate significant losses. Accordingly, this approach makes it possible to determine the historical scenarios used for the calculation of the stress test. This set of scenarios is also the subject of regular reviews. In 2020, two new historical scenarios related to the Covid-19 crisis were integrated: a crisis scenario (marked by a decline in equity indices and an increase in credit spreads) as well as a rebound scenario (marked by an increase in equity indices and a decrease in credit spreads). Societe Generale is currently using four historical scenarios in the calculation of the stress test, which cover the periods from October to December 2008 and March 2020.

Hypothetical scenarios

The hypothetical scenarios are defined with the Group's economists and are designed to identify possible sequences of events that could lead to a major crisis in the financial markets (*e.g.* European crisis, a drop in assets, etc.). The Group's aim is to select extreme but plausible events which would have major repercussions on all international markets. Accordingly, Societe Generale has defined seven hypothetical scenarios. ▲

Regulatory indicators

99% VALUE-AT-RISK (VAR)

Methodology

Audited I The Internal VaR Model was introduced at the end of 1996 and has been approved by the French regulator within the scope of the regulatory capital requirements. This approval was renewed in 2020 at the Target Review of Internal Models (TRIM).

The Value-at-Risk (VaR) assesses the potential losses on positions over a defined time horizon and for a given confidence interval (99% for Societe Generale). The method used is the "historical simulation" method, which implicitly takes into account the correlation between the various markets, as well as general and specific risk. It is based on the following principles:

- storage in a database of the risk factors that are representative of Societe Generale's positions (*i.e.* interest rates, share prices, exchange rates, commodity prices, volatility, credit spreads, etc.). Controls are regularly performed in order to check that all major risk factors for the trading portfolio of the Group are taken into account by the internal VaR model;
- definition of 260 scenarios corresponding to one-day variations in these market parameters over a rolling one-year period; these scenarios are updated daily with the inclusion of a new scenario and the removal of the oldest scenario. There are three coexisting methods for modeling scenarios (relative shocks, absolute shocks and hybrid shocks), the choice between these methods for a given risk factor is determined by its nature and its historical trend;
- the application of these 260 scenarios to the market parameters of the day;
- revaluation of daily positions, on the basis of the 260 sets of adjusted market parameters: in most cases this calculation involves a full repricing. Nonetheless, for certain risk factors, a sensitivity-based approach may be used.

Main risk factors	Description
Interest rates	Risk resulting from changes in interest rates and their volatility on the value of a financial instrument sensitive to interest rates, such as bonds, interest rate swaps, etc.
Share prices	Risk resulting from variations in prices and volatility of shares and equity indices, in the level of dividends, etc.
Exchange rates	Risk resulting from the variation of exchange rates between currencies and of their volatility.
Commodity prices	Risk resulting from changes in prices and volatility of commodities and commodity indices.
Credit Spreads	Risk resulting from an improvement or a deterioration in the credit quality of an issuer on the value of a financial instrument sensitive to this risk factor such as bonds, credit derivatives (credit default swaps for example).

Within the framework described above, the one-day 99% VaR, calculated according to the 260 scenarios, corresponds to the weighted average[2] of the second and third largest losses computed, without applying any weighting to the other scenarios.

(1) Including the scenarios used in the global stress tests on market activities.
(2) 39% of the second-highest risk and 61% of the third-highest risk.

The day-to-day follow-up of market risk is performed *via* the one-day VaR, which is calculated on a daily basis at various granularity levels. Regulatory capital requirements, however, oblige us to take into account a ten-day horizon, thus we also calculate a ten-day VaR, which is obtained by multiplying the one-day VaR aggregated at Group level by the square root of ten. This methodology complies with regulatory requirements and has been reviewed and validated by the regulator.

The VaR assessment is based on a model and a certain number of conventional assumptions, the main limitations of which are as follows:

- by definition, the use of a 99% confidence interval does not take into account losses arising beyond this point; VaR is therefore an indicator of the risk of loss under normal market conditions and does not take into account exceptionally significant fluctuations;
- VaR is computed using closing prices, meaning that intraday fluctuations are not taken into account;
- the use of a historical model is based on the assumption that past events are representative of future events and may not capture all potential events.

The Market Risk Department monitors the limitations of the VaR model by measuring the impacts of integrating a risk factor absent from the model (RNIME[1] process). Depending on the materiality of these missing factors, they may be capitalised. Other complementary measures also allow to control the limitations of the model.

The same model is used for the VaR computation for almost all of Global Banking & Investor Solution's activities (including those related to the most complex products) and the main market activities of Retail Banking and Private Banking. The few activities not covered by the VaR method, either for technical reasons or because the stakes are too low, are monitored using stress tests, and capital charges are calculated using the standard method or through alternative in-house methods. For example, the currency risk of positions in the banking book is not calculated with an internal model because this risk is not subject to a daily revaluation and therefore cannot be taken into account in a VaR calculation.

Backtesting

The relevance of the model is checked through continuous backtesting in order to verify whether the number of days for which the negative result exceeds the VaR complies with the 99% confidence interval. The results of the backtesting are audited by the Risk Department in charge of the validation of internal models, which, as second line of defence, also assesses the theoretical robustness (from a design and development standpoint), the correctness of the implementation and the adequacy of the model use. The independent review process ends with (i) review and approval Committees and (ii) an Audit Report detailing the scope of the review, the tests performed and their outcomes, the recommendations and the conclusion of the review. The model control mechanism gives rise to reporting to the appropriate authorities.

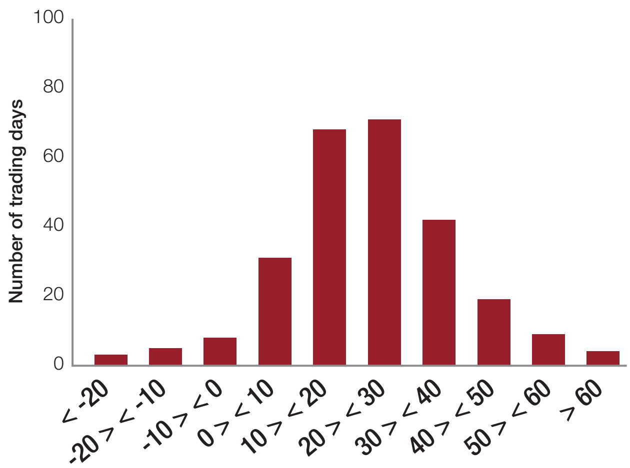
In compliance with regulations, backtesting compares the VaR to the (i) actual and (ii) hypothetical change in the portfolio's value:

- in the first case (backtesting against "actual P&L"), the daily P&L[2] includes the change in book value, the impact of new transactions and of transactions modified during the day (including their sales margins) as well as provisions and values adjustments made for market risk;
- in the second case (backtesting against "hypothetical P&L"), the daily P&L[3] includes only the change in book value related to changes in market parameters and excludes all other factors. ▲

In 2022, we observed:

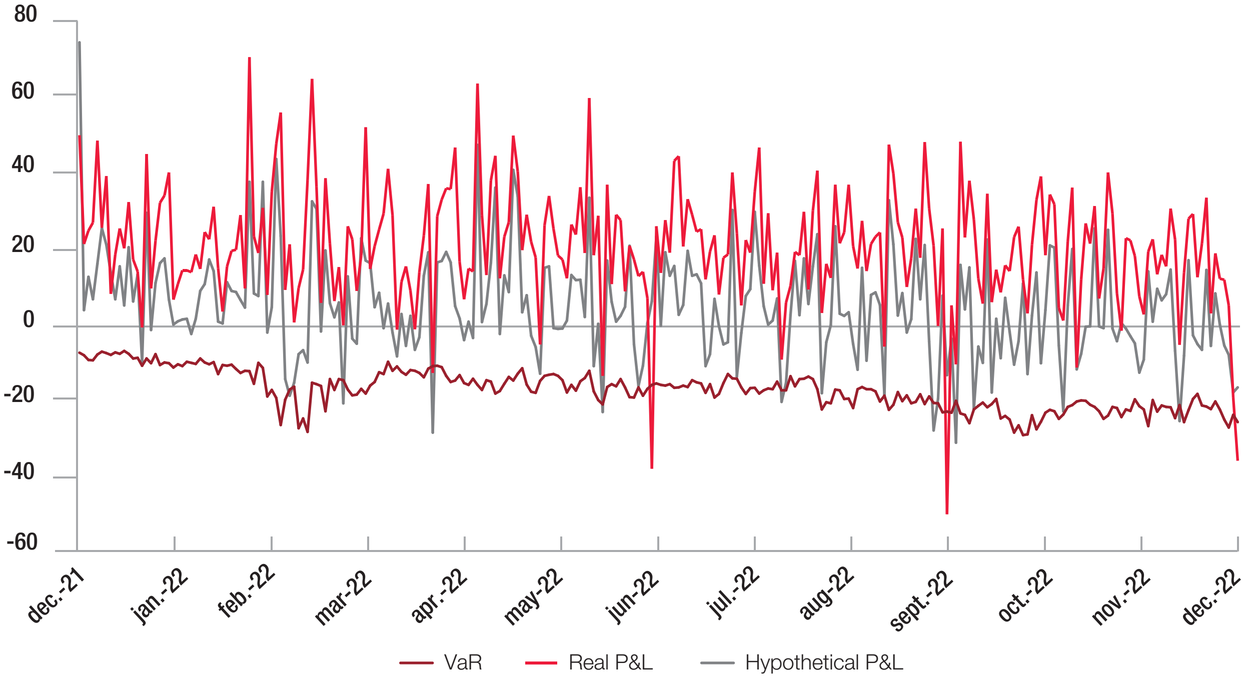
- four VaR backtesting, against actual P&L breaches (two in Q2, one in Q3 and one in Q4);
- eight VaR backtesting breaches, against hypothetical P&L (two breaches each quarter).

BREAKDOWN OF THE DAILY P&L OF MARKET[4] ACTIVITIES (2022, IN EURM)



(1) Risk Not In Model Engine.
(2) "Actual P&L" by agreement hereinafter.
(3) "Hypothetical P&L" by agreement hereinafter.
(4) Actual P&L

TRADING VAR (ONE-DAY, 99%), DAILY ACTUAL[1] P&L AND DAILY HYPOTHETICAL[2] P&L OF THE TRADING PORTFOLIO (2022, IN EURM)



VaR Changes

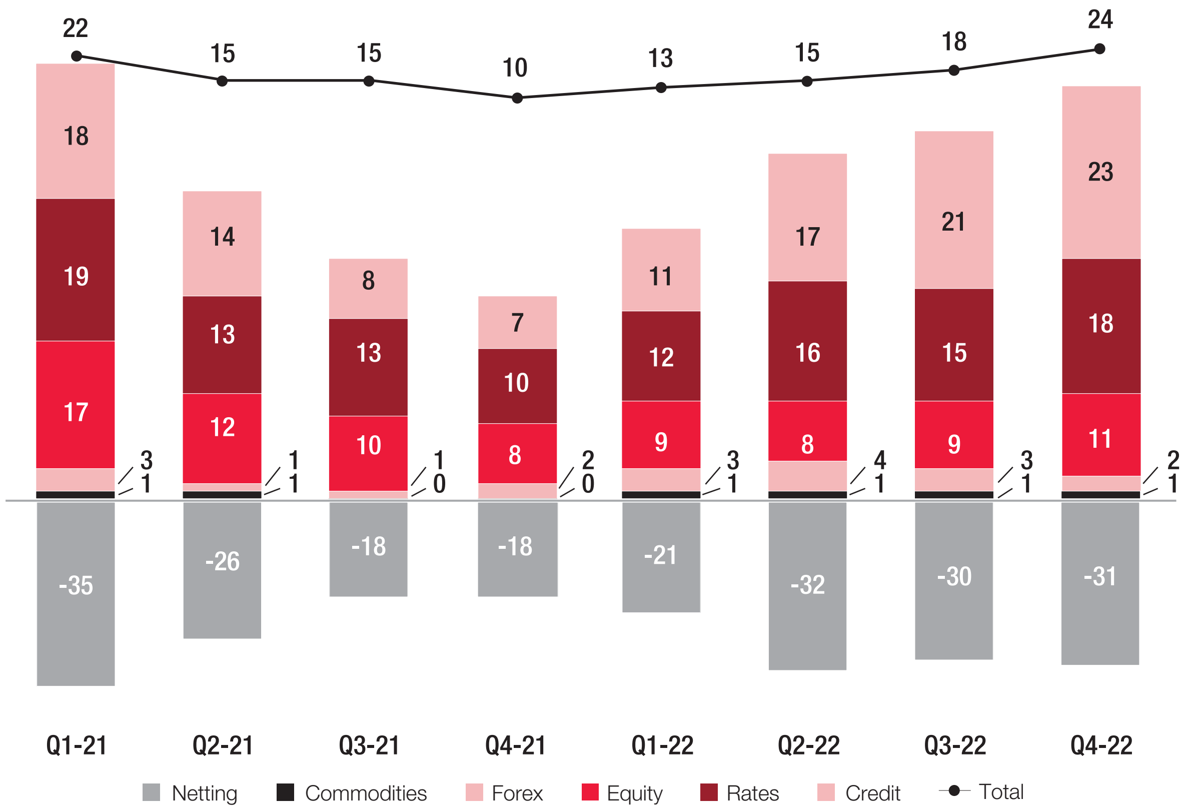
TABLE 30: REGULATORY TEN-DAY 99% VAR AND ONE-DAY 99% VAR

	31.12.2022		31.12.2021	
(In EURm)	VaR (10 days, 99%)[1]	VaR (1 day, 99%)[1]	VaR (10 days, 99%)[1]	VaR (1 day, 99%)[1]
Period start	25	8	75	24
Maximum value	95	30	98	31
Average value	56	18	49	15
Minimum value	22	7	18	6
Period end	75	24	25	8

(1) Over the scope for which capital requirements are assessed by the internal model.

(1) Daily result used for backtesting the VaR against the effective value of the portfolio as defined in the paragraph "Value-at-Risk 99% (VaR)".
(2) Daily result used for backtesting the VaR against the hypothetical value of the portfolio as defined in the paragraph "Value-at-Risk 99% (VaR)".

AUDITED I BREAKDOWN BY RISK FACTOR OF TRADING VAR (ONE-DAY, 99%) – CHANGES IN QUARTERLY AVERAGE OVER THE 2021-2022 PERIOD (IN EURM)



Audited I The VaR was riskier in 2022 (EUR 18 million *versus* EUR 15 million in 2021 on average), mainly due to the entry of new and more volatile scenarios following the deterioration of market conditions related to the war in Ukraine. The increase in risk is particularly evident in the Rates and Credit activities. ▲

STRESSED VAR (SVAR)

Audited I The Internal Stressed VaR model (SVaR) was introduced at the end of 2011 and has been approved by the Regulator within the scope of the regulatory capital requirements on the same scope as the VaR. As with the VaR model, this approval was renewed in 2020 at the Target Review of Internal Models (TRIM).

The calculation method used for the 99% one-day SVaR is the same as as the one for the VaR. It consists in carrying out a historical simulation with one-day shocks and a 99% confidence interval. Contrary to VaR, which uses 260 scenarios for one-day fluctuations over a rolling one-year period, SVaR uses a fixed one-year historical window corresponding to a period of significant financial tension.

Following a validation of the ECB obtained at the end of 2021, a new method for determining the fixed historical stress window is used. It consists in calculating an approximate SVaR for various risk factors selected as representative of the Societe Generale portfolio (related to equity, fixed income, foreign exchange, credit and commodity risks): these historical shocks are weighted according to the portfolio's sensitivity to each of these risk factors and aggregated to determine the period of highest stress for the entire portfolio[1]. The historical window used is reviewed annually. In 2022, this window was "September 2008-September 2009".

The ten-day SVaR used for the computation of the regulatory capital is obtained, as for VaR, by multiplying the one-day SVaR by the square root of ten.

As for the VaR, the Market Risk Department controls the limitations of the SVaR model by measuring the impact of integrating a risk factor absent from the model (RNIME process). Depending on the materiality of these missing factors, they may be capitalised. Other complementary measures also control the limitations of the model. The continuous backtesting performed on VaR model cannot be replicated to the SVaR model as, by definition, it is not sensitive to the current market conditions. However, as the VaR and the SVaR models rely on the same approach, they have the same advantages and limitations.

The relevance of the SVaR is regularly monitored and reviewed by the Risk Department in charge of the validation of internal models, as second line of defence. The independent review process ends with (i) review and approval Committees and (ii) an Audit Report detailing the scope of the review, the tests performed and their outcomes, the recommendations and the conclusion of the review. The model control mechanism gives rise to recurrent reporting to the appropriate authorities.

SVaR decreased slightly on average in 2022 (EUR 32 million *versus* EUR 37 million in 2021 on average). Without any particular trend over the year, the SVaR has evolved at levels similar to those of 2021 and with comparable variability. The level of the SVaR remains explained by the indexing and financing action activities, and by the interest rate scopes, while the exotic scopes partially offset the risk. ▲

(1) At the request of the ECB, a posteriori check is carried out to verify the relevance of this historical window by making calculations for full revaluation.

TABLE 31: REGULATORY TEN-DAY 99% SVAR AND ONE-DAY 99% SVAR

	31.12.2022		31.12.2021	
(In EURm)	Stressed VaR (10 days, 99%)(1)	Stressed VaR (1 day, 99%)(1)	Stressed VaR (10 days, 99%)(1)	Stressed VaR (1 day, 99%)(1)
Period start	96	30	135	43
Maximum value	165	52	191	60
Average value	101	32	117	37
Minimum value	55	17	72	23
Period end	145	46	108	34

(1) Over the scope for which capital requirements are assessed by the internal model.

IRC AND CRM

At end-2011, Societe Generale received approval from the Regulator to expand its internal market risk modeling system by including IRC (Incremental Risk Charge) and CRM (Comprehensive Risk Measure), for the same scope as for VaR. As with the VaR model, the approval of the IRC[1] model was renewed in 2020 at the Target Review of Internal Models (TRIM).

They estimate the capital charge on debt instruments that is related to rating migration and issuer default risks. These capital charges are incremental, meaning they are added to the charges calculated based on VaR and SVaR.

In terms of scope, in compliance with regulatory requirements:

- IRC is applied to debt instruments, other than securitisations and the credit correlation portfolio. In particular, this includes bonds, CDS and related derivatives;
- CRM exclusively covers the correlation portfolio, *i.e.* CDO tranches and First-to-Default products (FtD), as well as their hedging using CDS and indices.

Societe Generale estimates these capital charges using internal models[2]. These models determine the loss that would be incurred following especially adverse scenarios in terms of rating changes or issuer defaults for the year that follows the calculation date, without ageing the positions. IRC and CRM are calculated with a confidence interval of 99.9%: they represent the highest risk of loss obtained after eliminating 0.1% of the most unfavorable scenarios simulated.

The internal IRC model simulates rating transitions (including default) for each issuer in the portfolio, over a one-year horizon[3]. Issuers are classified into five categories: US-based companies, European companies, companies from other regions, financial institutions and sovereigns. The behaviours of the issuers in each category are correlated with one other through a systemic factor specific to each category. In addition, a correlation between these five systemic factors is integrated to the model. These correlations, along with the rating transition probabilities, are calibrated from historical data observed over the course of a full economic cycle. In case of change in an issuer's rating, the decline or improvement in its financial health is modeled by a shock in its credit spread: negative if the rating improves and positive in the opposite case. The price variation associated with each IRC scenario is determined after revaluation of positions *via* a sensitivity approach, using the delta, the gamma as well as the level of loss in the event of default (Jump to Default), calculated with the market recovery rate for each position.

The CRM model simulates issuer's rating transitions in the same way as the internal IRC model. In addition, the dissemination of the following risk factors is taken into account by the model:

- credit spreads;
- basis correlations;
- recovery rate excluding default (uncertainty about the value of this rate if the issuer has not defaulted);
- recovery rate in the event of default (uncertainty about the value of this rate in case of issuer default);
- First-to-Default valuation correlation (correlation of the times of default used for the valuation of the First-to-Default basket).

These dissemination models are calibrated from historical data, over a maximum period of ten years. The price variation associated with each CRM scenario is determined thanks to a full repricing of the positions. In addition, the capital charge computed with the CRM model cannot be less than a minimum of 8% of the capital charge determined with the standard method for securitisation positions.

The internal IRC and CRM models are subject to similar governance to that of other internal models meeting the Pillar 1 regulatory requirements. More specifically, an ongoing monitoring allows to follow the adequacy of IRC and CRM models and of their calibration. This monitoring is based on the review of the modeling hypotheses at least once a year. This review includes:

- a check of the adequacy of the structure of the rating transition matrices used for IRC and CRM models;
- a backtesting of the probabilities of default used for these two models;
- a check of the adequacy of the models for the dissemination of recovery rates, spread dissemination and dissemination of basic correlations used in the CRM calculation.

(1) The CRM model was not included in the Target Review of Internal Models.

(2) The same internal model is used for all portfolios for which an IRC calculation is required. The same is true for the portfolios on which a CRM calculation is performed. Note that the scope covered with internal models (IRC and CRM) is included in the VaR scope: only entities authorised for a VaR calculation via an internal model can use an internal model for IRC and CRM calculation.

(3) The use of a constant one-year liquidity horizon means that shocks that are applied to the positions to calculate IRC and CRM, are instantaneous one-year shocks. This hypothesis appears to be the most prudent choice in terms of models and capital, rather than shorter liquidity horizons.

Regarding the checks on the accuracy of these metrics:

- the IRC calculation being based on the sensitivities of each instrument – delta, gamma – as well as on the level of loss in the event of default (Jump to Default) calculated with the market recovery rate, the accuracy of this approach is checked against a full repricing every six months;
- such a check on CRM is not necessary as its computation is performed following a full repricing;
- these metrics are compared to normative stress tests defined by the regulator. In particular, the EBA stress test and the risk appetite exercise are performed regularly on the IRC metric. These stress tests consist of applying unfavorable rating migrations to issuers, shocking credit spreads and shocking rating transition matrices. Other stress tests are also carried out on an *ad hoc* basis to justify the correlation hypotheses between issuers and those made on the rating transition matrix;
- a weekly analysis of these metrics is carried out by the production and certification team for market risk metrics;
- the methodology and its implementation have been initially validated by the French Prudential and Resolution Supervisory Authority (*Autorité de contrôle prudentiel et de résolution* – ACPR). Thereafter, a review of the IRC and the CRM is regularly carried out by the Risk Department in charge of the validation of internal models as second line of defence. This independent review process ends with (i) review and approval Committees and (ii) an Audit Report detailing the scope of the review, the tests performed and their outcomes, the recommendations and the conclusion of the review. The model control mechanism gives rise to recurrent reporting to the appropriate authorities.

Moreover, regular operational checks are performed on the completeness of the scope's coverage as well as the quality of the data describing the positions.

TABLE 32: IRC (99.9%) AND CRM (99.9%)

(In EURm)	31.12.2022	31.12.2021
Incremental Risk Charge (99.9%)		
Period start	67	101
Maximum value	114	205
Average value	71	116
Minimum value	50	51
Period end	53	67
Comprehensive Risk Measure (99.9%)		
Period start	41	66
Maximum value	133	102
Average value	51	64
Minimum value	39	40
Period end	42	57

4.7.4 RISK-WEIGHTED ASSETS AND CAPITAL REQUIREMENTS

Allocation of exposures in the trading book

The on- and off-balance sheet items must be allocated to one of the two portfolios defined by prudential regulations: the banking book or the trading book.

The banking book is defined by elimination: all on- and off-balance sheet items not included in the trading book are included by default in the banking book.

The trading book consists of all positions in financial instruments and commodities held by an institution either for trading purposes or in order to hedge other positions in the trading book. The trading interest is documented as part of the traders' mandates.

The prudential classification of instruments and positions is governed as follows:

- the Finance Department's prudential regulation experts are responsible for translating the regulations into procedures, together with the Risk Department for procedures related to holding period and liquidity. They also analyse specific cases and exceptions. They share these procedures to the business lines;
- the business lines comply with these procedures. In particular, they document the trading interest of the positions taken by traders;
- the Finance and Risk Departments are in charge of the control framework.

The following controls are implemented in order to ensure that activities are managed in accordance with their prudential classification:

- new product process: any new product or activity is subject to an approval process that covers its prudential classification and regulatory capital treatment for transactions subject to validation;
- holding period: the Market Risk Department has designed a control framework for the holding period of certain instruments;
- liquidity: on a case-by-case basis or on demand, the Market Risk Department performs liquidity controls based on certain criteria (negotiability/transferability, bid/ask size, market volumes, etc.);
- strict process for any change in prudential classification, involving the business line and the Finance and Risk Divisions;
- internal audit: through its various periodic assignments, Internal Audit verifies or questions the consistency of the prudential classification with policies/procedures as well as the suitability of the prudential treatment in light of existing regulations.

Quantitative information

Around 85% of Societe Generale capital requirements related to market risk are determined using an internal model approach. The standard approach is mainly used for the Collective Investment Units (CIU), for securitisation positions, but also for the positions presenting a foreign exchange risk, which are not part of the trading book, as well as for the Group's subsidiaries that do not have access to the core IT tools developed internally. The main entities concerned are some International Retail Banking and Financial Services entities such as SG Maroc, BRD, SG Tunisie, SG Algérie, SG Côte d'Ivoire, etc.

Capital requirements for market risk increased in 2022. This increase is reflected in the VaR and the risks calculated under the standard approach:

- The VaR gradually increased over 2022, from a historically low level at the end of 2021. This increase is reflected in all activities, notably credit and interest rates.
- Risks calculated under the standard approach are on the rise, mainly due to the currency portion. This increase is partially offset by a reduction in the securitisation positions of the trading book.

TABLE 33: MARKET RISK CAPITAL REQUIREMENTS AND RWA BY RISK FACTOR

	Risk-weighted assets			Capital requirement		
(In EURm)	31.12.2022	31.12.2021	*Change*	31.12.2022	31.12.2021	*Change*
VaR	3,504	1,343	2,160	280	107	173
Stressed VaR	6,886	7,227	(340)	551	578	(27)
Incremental Risk Charge (IRC)	811	840	(29)	65	67	(2)
Correlation portfolio (CRM)	615	815	(200)	49	65	(16)
Total market risk assessed by internal model	**11,816**	**10,225**	**1,591**	**945**	**818**	**127**
Specific risk related to securitisation positions in the trading portfolio	150	562	(412)	12	45	(33)
Risk assessed for currency positions	987	-	987	79	-	79
Risks assessed for interest rates (excl. securitisation)	421	285	136	34	23	11
Risk assessed for ownership positions	374	572	(199)	30	46	(16)
Risk assessed for commodities	0	0	0	0	0	0
Total market risk assessed by standard approach	**1,932**	**1,419**	**513**	**155**	**114**	**41**
TOTAL	**13,747**	**11,643**	**2,104**	**1,100**	**931**	**168**

TABLE 34: MARKET RISK CAPITAL REQUIREMENTS AND RWA BY TYPE OF RISK

	Risk-weighted assets		Capital requirement	
(In EURm)	31.12.2022	31.12.2021	31.12.2022	31.12.2021
Risk assessed for currency positions	1,336	349	107	28
Risk assessed for credit (excl. deductions)	3,816	3,984	305	319
Risk assessed for commodities	24	39	2	3
Risk assessed for ownership positions	5,403	4,474	432	358
Risk assessed for interest rates	3,168	2,797	253	224
TOTAL	**13,747**	**11,643**	**1,100**	**931**

4.7.5 FINANCIAL INSTRUMENT VALUATION

Management risk related to the valuation of financial products relies jointly on the Markets Department and the team of valuation experts (Valuation Group) within the Finance Department that both embody the first line of defence and by the team of independent review of valuation methodologies within the Market Risk Department.

Governance

Governance on valuation topics is enforced through three valuation Committees, both attended by representatives of the Global Markets Division, the Market Risk Department and the Finance Division:

- the Valuation Risk Committee meets at least once a year to monitor and approve changes in the valuation risk management framework; monitor indicators on this risk and propose or set a risk appetite; evaluate the control system and the progress of recommendations; and finally, prioritize the tasks. This Committee is chaired by the Risk Department and organised by its independent review team of valuation methodologies;
- the Valuation Methodology Committee gathers whenever necessary, at least every quarter, to approve financial products valuation methodologies. This Committee, chaired by the Risk Department and organised by its independent review team of valuation methodologies, has global accountability with respect to the approval of the valuation policies;
- the MARK P&L Explanation Committee monthly analyses the main sources of economic P&L as well as changes in reserves and other accounting valuation adjustments. The analytical review of adjustments is carried out by the Valuation Group, which also provides a quarterly analytical review of adjustments under regulatory requirements for prudent valuation.

Lastly, a corpus of documents describes the valuation governance and specify the breakdown of responsibilities between the stakeholders.

Valuation principles and associated controls

Market products at fair value are marked to market, when such market prices exist; otherwise, they are valued using parameter-based models, in compliance with the IFRS 13 principles defining fair value.

On the one hand, each model designed by the front office is subject to independent validation by the Market Risks Department as second line of defence that especially checks the conceptual relevance of the model, its performance (especially in case of stressed conditions) and its implementation in systems. Following this review, the validation status of the model, its scope of use and the recommendations to be dealt with are formalised in a report.

On the other hand, the parameters used in the valuation models, whether they come from observable data on the markets or not, are described in marking policies[1] written by the front office and validated by the Market Risk Department. This system is complemented by specific controls carried out by LOD1 (in particular the Independent Price Verification process performed by the Finance Department).

If necessary the resulting valuations are supplemented by reserves or adjustments (mainly covering liquidity, parameter or model uncertainties) the calculation methodologies of which are developed jointly by the Valuation Group and the front office and reviewed by the Market Risk Department. These adjustments are made under fair value accounting requirements or prudent valuation regulatory requirements. The latter aim to capture valuation uncertainty in accordance with the procedures prescribed by the regulations through additional valuation adjustments in relation to the fair value (Additional Valuation Adjustments or AVA) directly deducted from Common Equity Tier 1 capital.

(1) Document describing the parameter determination methodology.

4.8 STRUCTURAL RISKS - INTEREST RATE AND EXCHANGE RATE RISKS

Audited I Structural exposure to interest rate and exchange rate risks results from commercial transactions, their associated hedging transactions and corporate centre transactions.

The interest rate and exchange rate risks linked to Trading Book activities are excluded from the structural risk measurement scope as they belong to the category of market risks.

Structural and market exposures constitute the Group's total interest rate and exchange rate exposure.

The general principle for managing structural interest rate and exchange rate risks within consolidated entities is to ensure that adverse movements in interest rates do not significantly threaten the Group's financial base or its future earnings.

Within the entities, commercial and corporate centre operations must therefore be matched in terms of interest rates and exchange rates as much as possible. At the consolidated level, a structural foreign exchange position is maintained in order to minimise the sensitivity of the Group's Common Equity Tier 1 (CET1) ratio to exchange rates fluctuations. ▲

4.8.1 ORGANISATION OF THE MANAGEMENT OF STRUCTURAL INTEREST RATE AND EXCHANGE RATE RISKS

The principles and standards for managing these risks are defined at the Group level. The entities are first and foremost responsible for managing these risks. The ALM (Asset and Liability Management) Department within the Group's Finance Division leads the control framework of the first line of defence. The ALM department of the Risk Department assumes the role of second line of defence supervision.

The Group Finance Committee, a General Management Body

The purpose of the Group Finance Committee is to:

- validate and ensure the adequacy of the system for monitoring, managing and supervising structural risks;
- review changes in the Group's structural risks through consolidated reporting;
- review and validate the measures proposed.

The Finance Committee gives delegation to the Global Rate Forex Committee chaired by the Finance Department and the Risk Division for the validation of frameworks not exceeding defined amounts.

The ALM Department, within the Group's Finance Department

The ALM (Asset and Liability Management) Department is responsible for:

- defining the structural risk policies for the Group and formalising risk appetite;
- analysing the Group's structural risk exposure and defining hedging strategies;
- monitoring the regulatory environment concerning structural risk;
- defining the ALM principles for the Group;
- defining the modelling principles applied by the Group's entities regarding structural risks;
- identifying, consolidating and reporting on Group structural risks;
- monitoring compliance with structural risk limits.

The ALM Risk Control Department within the Risk division

Within the Risk Division, the ALM Risk Department oversees structural risks and assesses the management system for these risks. As such, this department is in charge of:

- defining the steering indicators and overall stress test scenarios of the different types of structural risks and setting the main limits for the business divisions and the entities and Business Units (BU) and Service Units (SU);
- defining the normative environment of the structural risk metrics, modelling and framing methods.

In addition, RISQ/MRM authorises this department to validate ALM models for which it organises and chairs the Validation Committee of Models. Finally, he chairs the Model Validation Committee and the ALM Standards Validation Committee and thus ensures that the regulatory framework is correctly interpreted and that the SG environment is properly adapted.

The entities and BU/SU are responsible for ALM risk management

Each entity, each BU/SU, manages its structural risks and is responsible for regularly assessing risks incurred, producing the risk report and developing and implementing hedging options. Each entity, each BU/SU is required to comply with Group standards and to adhere to the limits assigned to it.

As such, the entities and the BUs/SUs apply the standards defined at Group level and develop the models, with the support of the central modelling teams of the Finance Department.

A dedicated ALM manager reporting to the Finance Department in each entity, BU/SU, is responsible for monitoring these risks (first-level control). This manager is responsible for reporting ALM risks to the Group Finance Department. All entities, BU/SU, have an ALM Committee responsible for implementing validated models, managing exposure to interest rate and exchange rate risks and implementing hedging programmes in accordance with the principles set out by the Group and the limits validated by the Finance Committee and the BU/SU ALM Committees.

4.8.2 STRUCTURAL INTEREST RATE RISK

Structural interest rate risk is generated by commercial transactions and their hedging, as well as the management operations specific to each of the consolidated entities.

The Group's objective

The objective of managing structural interest rate risk is to manage exposure of each Group entity.

To this end, the Board of Directors, the Finance Committee and the ALM Committee set sensitivity limits (in terms of value and income) for the Group, the BUs/SUs and the entities respectively.

Measuring and monitoring structural interest rate risk

Societe Generale uses several indicators to measure the Group's overall interest rate risk. The three most important indicators are:

- the sensitivity of the net present value (NPV) to the risk of interest rate mismatch. It is measured as the sensitivity of the net present value of the static balance sheet to a change in interest rates. This measure is calculated for all currencies to which the Group is exposed;
- the sensitivity of the interest margin to changes in interest rates in various interest rate scenarios. It takes into account the sensitivity generated by future commercial production;
- the sensitivity of NPV to basis risk (risk associated with decorrelation between different variable rate indices).

Limits on these indicators are applicable to the Group, the BUs/SUs and the various entities. Limits are set for shocks at +/-0.1% and for stressed shocks (+/-1% for value sensitivity and +/-2% for income sensitivity) without floor application. Only the sensitivity of income over the first two years is framed. The measurements are computed monthly 10 months a year (with the exception of the months of January and July for which no Group-level closing is acheved). An additional synthetic measurement of value sensitivity – all currencies – is framed for the Group. To comply with these frameworks, the entities combine several possible approaches:

- strategic focus of the commercial policy so as to net interest rate positions taken on the asset and liability side;
- implementation of a swap operation or – failing this in the absence of such a market – use of a loan/borrowing operation;
- purchase/sale of options on the market to cover optional positions taken vis-à-vis our clients.

Assets and liabilities are analysed without a prior allocation of resources to uses. Maturities of outstanding amounts are determined by taking into account the contractual characteristics of the transactions, adjusted for the results of customer behaviour modelling (in particular for demand deposits, savings and early loan repayments), possibly differentiated according to the rate scenario considered, as well as a certain number of disposal agreements, in particular on equity items.

As at 31 December 2022, the main models applicable for the calculation of interest rate risk measurements are models (which are sometimes rate-dependent) on part of the deposits without a maturity date leading to an average duration of less than 5 years, with the schedule in some cases reaching the maximum maturity of 20 years.

The automatic balance sheet options are taken into account:

- either *via* the Bachelier formula or possibly from Monte-Carlo type calculations for value sensitivity calculations; or
- by taking into account the pay-offs depending on the scenario considered in the income sensitivity calculations.

Changes in OCI or P&L of instruments recognised at fair value are not included in the controlled income sensitivity measures.

Hedging transactions are mainly documented from an accounting viewpoint: this can be carried out either as micro-hedging (individual hedging of commercial transactions and hedging instruments) or as macro-hedging under the IAS 39 "carve-out" arrangement (global backing of portfolios of similar commercial transactions within a Treasury Department; macro-hedging concerns essentially French retail network entities).

Macro-hedging derivatives are essentially interest rate swaps in order to maintain networks' net asset value and result sensitivity within limit frameworks, considering hypotheses applied. For macro-hedging documentation, the hedged item is an identified portion of a portfolio of commercial client or interbank operations. Conditions to respect in order to document hedging relationships are reminded in Note 3.2 to the consolidated financial statements.

Macro-hedging derivatives are allocated to separate portfolios according to whether they are used to hedge fixed-rate assets or liabilities in the accounting books. The hedging instrument portfolios allocated to liability elements are net fixed-rate receiver/variable-rate payer whereas the hedging instrument portfolios allocated to asset elements are net fixed-rate payer/variable-rate receiver.

In the context of the macro-hedging, the controls carried out and documented enable to verify that intra-group transactions are returned to the market, to verify the non-over hedging and the non-disappearence of the items hedged and the effectiveness of the hedges (MTM change in hedging instruments / MTM change in hedged items in the 80-125% range).

TABLE 35: INTEREST RATE RISK OF NON-TRADING BOOK ACTIVITIES (IRRBB1)

		31.12.2022	
(In EURm)		Changes of the economic value of equity (EVE)	Changes of the net interest income (NII)
Supervisory shock scenarios*			
1	Parallel up	(2 900)	375
2	Parallel down	1 011	(1 102)
3	Steepener	1 875	
4	Flattener	(2 547)	
5	Short rates up	(2 747)	
6	Short rates down	2 862	

		31.12.2021	
(In EURm)		Changes of the economic value of equity (EVE)	Changes of the net interest income (NII)
Supervisory shock scenarios*			
1	Parallel up	(6,784)	240
2	Parallel down	(2,683)	(219)
3	Steepener	463	
4	Flattener	(4,033)	
5	Short rates up	(3,643)	
6	Short rates down	79	

* *The above 6 shock scenarios are detailed in Appendix 3 of the EBA/GL/2018/02 regulation (refer to EBA BS 2018 XXX Proposed final revised IRRBB Guidelines.docx (europa.eu)).*

4.8.3 STRUCTURAL EXCHANGE RATE RISK

Audited I Structural exchange rate risk, understood as resulting from all transactions that do not belong to the Trading Book, results from:

- exposures related to net investments abroad in foreign currencies, i.e. in subsidiaries and branches. FX positions generated by an imperfect hedge are valued through other comprehensive income;
- exposures related to activities made by entities in currencies that are not their reporting currency.

The Group's policy is to make the CET1 ratio insensitive to fluctuations in exchange rates against the euro.

As such:

- Group entities are asked to individually hedge the results related to activities in currencies other than their reporting currency;
- the foreign exchange position generated by investments in foreign holdings and branches, as well as by the conversion of their results into euros, is partially covered centrally: at the level of the Group Finance Division. Societe Generale retains a target exposure multiplied by the RWA generated in this currency in each RWA constituent currency equivalent to the level of the CET1 Target Group ratio and covers the balance by borrowings or forward foreign exchange transactions denominated in the currency of investments and recognised as investment hedging instruments (cf. Note 3.2).

For each currency, the difference between actual and target exposure is governed by limits validated by the General Management in Finance Committee and the Board of Directors.

Similarly, the sensitivities of the CET1 ratio to shocks of +/-10% per currency are framed. ▲

TABLE 36: SENSITIVITY OF THE GROUP'S COMMON EQUITY TIER 1 RATIO TO A 10% CHANGE IN THE CURRENCY (IN BASIS POINTS)

	Impact of a 10% currency depreciation on the Common Equity Tier 1 ratio		Impact of a 10% currency appreciation on the Common Equity Tier 1 ratio	
Currency	31.12.2022	31.12.2021	31.12.2022	31.12.2021
CHF	0.2	(0.1)	(0.2)	0.1
CZK	(0.4)	0.4	0.4	(0.4)
MAD	(0.2)	(0.0)	0.2	0.0
RON	0.3	0.4	(0.3)	(0.4)
RUB	0.3	0.5	(0.3)	(0.5)
TND	(0.2)	0.1	0.2	(0.1)
TRY	0.2	(0.0)	(0.2)	0.0
USD	0.6	0.8	(0.6)	(0.8)
XAF	(0.6)	0.6	0.6	(0.6)
Autres	(0.8)	0.1	0.8	(0.1)

4.9 STRUCTURAL RISK - LIQUIDITY RISK

Audited I Liquidity risk is defined as the risk that the bank does not have the necessary funds to meet its commitments. Funding risk is defined as the risk that the Group will no longer be able to finance its activities with appropriate column of assets and at a reasonable cost.

4.9.1 OBJECTIVES AND GUIDING PRINCIPLES

The liquidity and funding management set up at Societe Generale aims at ensuring that the Group can (i) fulfil its payment obligations at any moment in time, during normal course of business or under lasting financial stress conditions (management of liquidity risks); (ii) raise funding resources in a sustainable manner, at a competitive cost compared to peers (management of funding risks). Doing so, the liquidity and funding management ensures compliance with risk appetite and regulatory requirements

To achieve these objectives, Societe Generale has adopted the following guiding principles:

- liquidity risk management is centralised at Group level, ensuring pooling of resources, optimisation of costs and consistent risk management. Businesses must comply with static liquidity deadlocks in normal situations, within the limits of their supervision and the operation of their activities, by carrying out operations with the "own management" entity, where appropriate, according to an internal refinancing schedule. Assets and liabilities with no contractual maturity are assigned maturities according to agreements or quantitative models proposed by the Finance Department and by the business lines and validated by the Risk Division;
- funding resources are based on business development needs and the risk appetite defined by the Board of Directors. See below the "Funding Plan" chapter in section 2;
- financing resources are diversified by currencies, investor pools, maturities and formats (vanilla issues, structured, secured notes, etc.). Most of the debt is issued by the parent company. However, Societe Generale also relies on certain subsidiaries to raise resources in foreign currencies and from pools of investors complementary to those of the parent company;
- liquid reserves are built up and maintained in such a way as to respect the stress survival horizon defined by the Board of Directors. Liquid reserves are available in the form of cash held in central banks and securities that can be liquidated quickly and housed either in the banking book, under direct or indirect management of the Group Treasury, or in the trading book within the market activities under the supervision of the Group Treasury;
- the Group has options that can be activated at any time under stress, through an Emergency Financing Plan (EFP) at Group level (except for insurance activities, which have a separate contingency plan), defining leading indicators for monitoring the evolution of the liquidity situation, operating procedures and remedial actions that can be activated in a crisis situation.

4.9.2 THE GROUP'S PRINCIPLES AND APPROACH TO LIQUIDITY RISK MANAGEMENT

The key operational steps of liquidity and funding management are as follows:

- risk identification is a process which is set out and documented by the Risk Division, in charge of establishing a mapping of liquidity risks. This process is conducted yearly with each Business Unit and within the Group Treasury Department, aimed at screening all material risks and checking their proper measurement and capturing the control framework. In addition, a Reverse Stress Testing process exists, which aims at identifying and quantifying the risk drivers which may weigh most on the liquidity profile under assumptions even more severe than used in the regular stress test metrics;
- definition, implementation and periodic review of liquidity models and conventions used to assess the duration of assets and liabilities and to assess the liquidity profile under stress. Liquidity models are managed along the overall Model Risk Management governance, also applicable to other risk factors (market, credit, operational), controlled by the Group Risk division;
- yearly definition of the risk appetite for liquidity and funding risks, whereby the Board of Directors approves financial indicators framing that have been proposed by General Management. Such risk appetite targets are then cascaded down per Business Units. The risk appetite is framed along the following metrics:
  - key regulatory indicators (LCR, Adjusted LCR excess in USD, and NSFR),
  - the footprint of the Group in Short-Term Wholesale funding markets,
  - the survival horizon under an adverse stress scenario, combining a severe market and systemic shock and an idiosyncratic shock. In addition to the main adverse scenario, Societe Generale also checks its survival horizon under an extreme stress scenario. For both scenarios, the idiosyncratic shock is characterised by one of its main consequences, which would be an immediate 3-notch downgrade of Societe Generale's long-term rating. In such adverse or extreme scenarios, the liquidity position of the Group is assessed over time, taking into account the negative impacts of the scenarios, such as deposit outflows, drawing by clients of the committed facilities provided by Societe Generale, increase in margin calls related to derivatives portfolios, etc. The survival horizon is the moment in time when the net liquidity position under such assumptions becomes negative,

- the overall transformation position of the Group (static liquidity deadlock in normal situation matured up to a maturity of 5 years),
- the amount of free collaterals providing an immediate access to central bank funding, in case of an emergency (only collaterals which do not contribute to the numerator of the LCR are considered, i.e. non-HQLA collaterals);

- the financial trajectories under baseline and stressed scenarios are determined within the framework of the funding plan to respect the risk appetite. The budget's baseline scenario reflects the central assumptions for the macro-economic environment and the business strategy of the Group, while the stressed scenario is factoring both an adverse macro-economic environment and idiosyncratic issues;
- the funding plan comprises both the long-term funding programme, which frames the issuance of plain vanilla bonds and structured notes, and the plan to raise short-term funding resources in money markets;
- the Funds Transfer Pricing (FTP) mechanism, drawn up and maintained within the Group Treasury, provides internal refinancing schedules that enable businesses to recover their excess liquidity and finance their needs through transactions carried out with its own management;
- production and communication of periodic liquidity reports, at various frequencies (daily indicators, weekly indicators, monthly indicators), leveraging in most part on the central data repository, operated by a dedicated central production team. The net liquidity position under the combined (idiosyncratic and market/systemic) stress scenario is reassessed on a monthly basis and can be analysed along multiple axes (per product, Business Unit, currency, legal entity). Each key metric (LCR, NSFR, transformation positions, net liquidity position under combined stress) is reviewed formally on a monthly basis by the Group Finance and Risk divisions. Forecasts are made and revised weekly by the Strategic and Financial Steering Department and reviewed during a Weekly Liquidity Committee chaired by the Head of Group Treasury. This Weekly Liquidity Committee gives tactical instructions to Business Units, with the objective to adjust in permanence the liquidity and funding risk profile, within the limits and taking into account business requirements and market conditions;
- preparation of a Contingency Funding Plan, which is applicable Group-wide, and provides for: (i) a set of early warning indicators (e.g. market parameters or internal indicators); (ii) the operating model and governance to be adopted in case of an activation of a crisis management mode (and the interplay with other regimes, in particular Recovery management); (iii) the main remediation actions to be considered as part of the crisis management.

These various operational steps are part of the ILAAP (Internal Liquidity Adequacy Assessment Process) framework of Societe Generale.

Every year, Societe Generale produces for its supervisor, the ECB, a self-assessment of the liquidity risk framework in which key liquidity and funding risks are identified, quantified and analysed with both a backward and a multi-year forward-looking perspective. The adequacy self-assessment also describes qualitatively the risk management set up (methods, processes, resources, etc.), supplemented by an assessment of the adequacy of the Group's liquidity.

4.9.3 GOVERNANCE

The main liquidity risk governance bodies are as follows:

- the Board of Directors, which:
  - sets yearly the level of liquidity risk tolerance as part of the Group's risk appetite, based on a set of key metrics, which includes both internal and regulatory metrics, in particular the period of time during which the Group can operate under stressed conditions ("survival horizon"),
  - approves financial indicators framing including the scarce resources indicators framing,
  - reviews at least quarterly the Group's liquidity and funding situation: key liquidity metrics, including stressed liquidity gap metrics as evaluated through Societe Generale group models, the regulatory metrics LCR and NSFR, the pace of execution of the funding plan and the related cost of funds;
- General Management, which:
  - allocates liquidity and funding targets to the various Business Units and the Group Treasury entity, upon proposal from the Group Finance division,
  - defines and implements the liquidity and funding risk strategy, based on inputs from the Finance and Risk Divisions and the Business Units. In particular, the General Management chairs the Finance Committee, held every 6 weeks and attended by representatives from the Finance and Risk Divisions and Business Units, which is responsible for monitoring structural risks and managing scarce resources:
    - validation and monitoring of the set of limits for structural risks, including liquidity risk,
    - monitoring of budget targets and decisions in case of a deviation from the budget,
    - definition of principles and methods related to liquidity risk management (e.g. definition of stress scenarios),
    - assessment of any regulatory changes and their impacts;
- the Finance Department, which is responsible for the liquidity and funding risks as first line of defence, interacting closely with Business Units. Within the Finance Department, there are three main departments involved respectively in the preparation and implementation of decisions taken by the abovementioned bodies:
  - the Strategic and Financial Steering Department is responsible for framing and steering the Group's scarce resources, including liquidity, within the Group's risk appetite and financial indicators framing,
  - the Group Treasury Department is in charge of all aspects of the operational management of liquidity and funding across the Group, including managing the liquidity position, executing the funding plan, supervising and coordinating treasury functions, providing operational expertise in target setting, managing the liquidity reserves and the collateral used in funding transactions, managing the corporate centre,
  - the Asset and Liability Management Department is in charge of the definition of modelling and monitoring structural risks, including liquidity risk alongside interest rate and foreign exchange risks in the Banking Book;
- also sitting with the Finance Department, the Metrics Production Department runs the management information system regarding liquidity and funding risks across the Group. For liquidity metrics, the Group relies on a centralised system architecture, with all Business Units feeding a central data repository from which all metrics are produced, either regulatory metrics (e.g. the LCR or the NSFR) or metrics used for internal steering (e.g. stress test indicators);
- the ALM Risk Department, which perform as the second line of defence functions, ensure the supervision of liquidity risks and evaluates the management system for these risks. As such, it is in charge of:

- defining liquidity indicators and the setting of the main existing limits within the Group;
- defining the normative framework for measuring, modelling methods and monitoring these risks.

In addition, by delegation of MRM, this department ensures the validation of ALM models for which it organises and chairs the Validation Committee of Models.

Finally, it ensures the correct interpretation of the regulatory framework as well as an adequate implementation in the Societe Generale environment.

4.9.4 LIQUIDITY RESERVE

The Group's liquidity reserve encompasses cash at central banks and assets that can be used to cover liquidity outflows under a stress scenario. The reserve assets are available, *i.e.* not used in guarantee or as collateral on any transaction. They are included in the reserve after applying a haircut to reflect their expected valuation under stress. The Group's liquidity reserve contains assets that can be freely transferred within the Group or used to cover subsidiaries' liquidity outflows in the event of a crisis: non-transferable excess cash (according to the regulatory ratio definition) in subsidiaries is therefore not included in the Group's liquidity reserve.

The liquidity reserve includes:

- central bank deposits, excluding mandatory reserves;
- High-Quality Liquid Assets (HQLAs), which are securities that can be quickly monetised on the market via sale or repurchase transactions; these include government bonds, corporate bonds and equities listed on major indices (after haircuts). These HQLAs meet the eligibility criteria for the LCR, according to the most recent standards known and published by regulators. The haircuts applied to HQLA securities are in line with those indicated in the most recent known texts on determining the numerator of the LCR;
- non-HQLA Group assets that are central bank-eligible, including receivables as well as covered bonds and securitisations of Group receivables held by the Group.

TABLE 37: LIQUIDITY RESERVE

(In EURbn)	31.12.2022	31.12.2021
Central bank deposits (excluding mandatory reserves)	195	168
HQLA securities available and transferable on the market (after haircut)	59	58
Other available central bank-eligible assets (after haircut)	24	3
TOTAL	**279**	**229**

4.9.5 REGULATORY RATIOS

Regulatory requirements for liquidity risk are managed through two ratios:

- the Liquidity Coverage Ratio (LCR), which aims to ensure that banks hold sufficient liquid assets or cash to survive to a significant stress scenario combining a market crisis and a specific crisis and lasting for one month The minimum regulatory requirement is 100% at all times;
- the Net Stable Funding Ratio (NSFR), a long-term ratio of the balance sheet transformation, which compares the financing needs generated by the activities of institutions with their stable resources; The minimum level required is 100%.

In order to meet these requirements, the Group ensures that its regulatory ratios are managed well beyond the minimum regulatory requirements set by Directive 2019/878 of the European Parliament and of the Council of 20 May 2019 (CRD5) and Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 May 2019 (CRR2)(1).

Societe Generale's LCR ratio has always been above 100%: 141% at the end of 2022 compared to 129% at the end of 2021. Since it came into force, the NSFR ratio has always been above 100% and stands at 114% at the end of 2022 compared to 110% at the end of 2021.

(1) Several amendments to European regulatory standards were adopted in May 2019: the text on the CRL, published in October 2014, has since been supplemented by a Delegated Act corrigendum which entered into force on 30 April 2020. The minimum level of the required ratio has been 100% since 1 January 2018. The NSFR requirement included in CRR2 (EU) 2019/876 of 20 May 2019 has applied since June 2021. The required ratio is 100%.

4.9.6 BALANCE SHEET SCHEDULE

The main lines of the Group's financial liabilities and assets are presented in Note 3.13 to the consolidated financial statements.

TABLE 38: BALANCE SHEET SCHEDULE

FINANCIAL LIABILITIES

	31.12.2022					
(In EURm)	Note to the consolidated financial statements	0-3 m	3 m-1 yr	1-5 yrs	>5 yrs	Total
Due to central banks		8,361	-	-	-	8,361
Financial liabilities at fair value through profit or loss, excluding derivatives	Notes 3.1 et 3.4	150,413	22,543	29,654	25,940	228,550
Due to banks	Note 3.6	49,803	39,639	42,213	1,333	132,988
Customer deposits	Note 3.6	475,608	27,233	23,101	4,822	530,764
Securitised debt payables	Note 3.6	34,158	24,030	46,583	28,405	133,176
Subordinated debt	Note 3.9	3	-	6,062	9,881	15,946

NB: The scheduling assumptions for these liabilities are presented in Note 3.13 to the consolidated financial statements. In particular, the data are shown without provisional interest and excluding derivatives.

	31.12.2021					
(In EURm)	Note to the consolidated financial statements	0-3 m	3 m-1 yr	1-5 yrs	>5 yrs	Total
Due to central banks		5,152	-	-	-	5,152
Financial liabilities at fair value through profit or loss, excluding derivatives		136,581	17,693	23,438	23,244	200,956
Due to banks	Note 3.6	57,174	4,185	76,106	1,712	139,177
Customer deposits	Note 3.6	470,890	15,244	16,568	6,431	509,133
Securitised debt payables	Note 3.6	89,671	12,164	19,040	14,449	135,324
Subordinated debt	Note 3.9	7,735	61	3,649	4,514	15,959

NB: The scheduling assumptions for these liabilities are presented in Note 3.13 to the consolidated financial statements. In particular, the data are shown without provisional interest and excluding derivatives.

FINANCIAL ASSETS

	31.12.2022					
(In EURm)	**Note to the consolidated financial statements**	**0-3 m**	**3 m-1 yr**	**1-5 yrs**	**>5 yrs**	**Total**
Cash, due from central banks		203,389	734	1,808	1,082	207,013
Financial assets at fair value through profit or loss, excluding derivatives	Note 3.4	242,458	11,045	-	-	253,503
Financial assets at fair value through other comprehensive income	Note 3.4	37,066	132	-	265	37,463
Securities at amortised cost	Note 3.5	6,939	4,718	6,547	3,226	21,430
Due from banks at amortised cost	Note 3.5	57,524	1,569	7,348	462	66,903
Customer loans at amortised cost	Note 3.5	111,407	62,807	183,235	120,477	477,927
Lease financing agreements(1)	Note 3.5	2,760	6,014	15,663	4,165	28,602

(1) Amounts are presented net of impairments.

	31.12.2021					
(In EURm)	**Note to the consolidated financial statements**	**0-3 m**	**3 m-1 yr**	**1-5 yrs**	**>5 yrs**	**Total**
Cash, due from central banks		176,064	822	1,988	1,095	179,969
Financial assets at fair value through profit or loss, excluding derivatives	Note 3.4	233,186	9,173	-	-	242,359
Financial assets at fair value through other comprehensive income	Note 3.4	42,798	380	-	272	43,450
Securities at amortised cost	Note 3.5	16,686	289	1,480	916	19,371
Due from banks at amortised cost	Note 3.5	47,182	3,619	4,715	456	55,972
Customer loans at amortised cost	Note 3.5	94,978	65,686	189,325	117,555	467,544
Lease financing agreements(1)	Note 3.5	2,778	6,378	16,024	4,440	29,620

(1) Amounts are presented net of impairments.

Due to the nature of its activities, Société Générale holds derivative products and securities whose residual contractual maturities are not representative of its activities or risks.

By agreement, the following residual maturities were used for the classification of financial assets:

1. assets measured at fair value through profit or loss, excluding derivatives (client-related trading assets):
   - positions measured using prices quoted on active markets (L1 accounting classification): maturity of less than 3 months,
   - positions measured using observable data other than quoted prices (L2 accounting classification): maturity of less than 3 months,
   - positions measured mainly using unobservable market data (L3): maturity of 3 months to 1 year;
2. financial assets at fair value through other comprehensive income:
   - available-for-sale assets measured using prices quoted on active markets: maturity of less than 3 months,
   - bonds measured using observable data other than quoted prices (L2): maturity of 3 months to 1 year,
   - finally, other securities (shares held long-term in particular): maturity of more than 5 years.

As regards the other lines of the balance sheet, other assets and liabilities and their associated conventions can be broken down as follows:

OTHER LIABILITIES

	31.12.2022						
(In EURm)	**Note to the consolidated financial statements**	**Not scheduled**	**0-3 m**	**3 m-1 yr**	**1-5 yrs**	**> 5 yrs**	**Total**
Tax liabilities	Note 6.3	-	-	807	831	-	1,638
Revaluation difference on portfolios hedged against interest rate risk		(9,659)	-	-	-	-	(9,659)
Other liabilities	Note 4.4	-	100,859	1,969	2,864	1,861	107,553
Non-current liabilities held for sale	Note 2.5	-	-	220	-	-	220
Insurance contracts related liabilities	Note 4.3	-	5,345	10,055	39,677	86,611	141,688
Provisions	Note 8.3	4,579	-	-	-	-	4,579
Shareholders' equity		72,782	-	-	-	-	72,782

	31.12.2021						
(In EURm)	**Note to the consolidated financial statements**	**Not scheduled**	**0-3 m**	**3 m-1 yr**	**1-5 yrs**	**> 5 yrs**	**Total**
Tax liabilities	Note 6.3	-	-	836	741	-	1,577
Revaluation difference on portfolios hedged against interest rate risk		2,832	-	-	-	-	2,832
Other liabilities	Note 4.4	-	98,035	2,241	3,023	3,006	106,305
Non-current liabilities held for sale		1	-	-	-	-	1
Insurance contracts related liabilities	Note 4.3	-	15,566	10,232	40,848	88,642	155,288
Provisions	Note 8.3	4,850	-	-	-	-	4,850
Shareholders' equity		70,863	-	-	-	-	70,863

OTHER ASSETS

	31.12.2022						
(In EURm)	Note to the consolidated financial statements	Not scheduled	0-3 m	3 m-1 yr	1-5 yrs	> 5 yrs	Total
Revaluation differences on portfolios hedged against interest rate risk		(2,262)	-	-	-	-	(2,262)
Other assets	Note 4.4	-	85,072	-	-	-	85,072
Tax assets	Note 6	4,696	-	-	-	-	4,696
Deferred profit-sharing			1,170	0	1	4	1,175
Investments accounted for using the equity method		-	-	-	-	146	146
Tangible and intangible fixed assets	Note 8.4	-	-	-	-	33,089	33,089
Goodwill	Note 2.2	-	-	-	-	3,781	3,781
Non-current assets held for sale	Note 2.5	-	1	1,049	15	17	1,081
Investments of insurance companies	Note 4.3	-	34,774	7,907	35,418	80,316	158,415

	31.12.2021						
(In EURm)	Note to the consolidated financial statements	Not scheduled	0-3 m	3 m-1 yr	1-5 yrs	> 5 yrs	Total
Revaluation differences on portfolios hedged against interest rate risk		131	-	-	-	-	131
Other assets	Note 4.4	-	92,898	-	-	-	92,898
Tax assets	Note 6	4,812	-	-	-	-	4,812
Investments accounted for using the equity method		-	-	-	-	95	95
Tangible and intangible fixed assets	Note 8.4	-	-	-	-	31,968	31,968
Goodwill	Note 2.2	-	-	-	-	3,741	3,741
Non-current assets held for sale		-	1	2	12	12	27
Investments of insurance companies		-	49,908	5,632	36,781	86,577	178,898

1. Revaluation differences on portfolios hedged against interest rate risk are not scheduled, as they comprise transactions backed by the portfolios in question. Similarly, the schedule of tax assets whose schedule would result in the early disclosure of income flows is not made public.
2. Other assets and other liabilities (guarantee deposits and settlement accounts, miscellaneous receivables) are considered as current assets and liabilities.
3. The notional maturities of commitments in derivative instruments are presented in Note 3.2.2 to the consolidated financial statements.
4. Investments in subsidiaries and affiliates accounted for by the equity method and Tangible and intangible fixed assets have a maturity of more than five years.
5. Provisions and shareholders' equity are not scheduled.

4.10 OPERATIONAL RISK

In line with the Group's Risk taxonomy, operational risk is one of the non-financial risks monitored by the Group. Operational risk is the risk of losses resulting from inadequacies or failures in processes, personnel or information systems, or from external events.

Societe Generale's operational risk classification is divided into eight event categories:

- commercial litigation;
- disputes with authorities;
- errors in pricing or risk evaluation including model risk;
- execution errors;
- fraud and other criminal activities;
- rogue trading;
- loss of operating resources;
- IT system interruptions.

This classification ensures consistency throughout the system and enabling cross-business analyses throughout the Group (see section 4.10.2), particularly on the following risks:

- risks related to information and communication technologies and security (cybercrime, IT systems failures, etc.);
- risks related to outsourcing of services and business continuity;
- risks related to the launch of new products/services/activities for customers;
- non-compliance risk (including legal and tax risks) represents the risk of legal, administrative or regulatory sanctions, material financial loss, or loss to reputation a bank may suffer as a result of its failure to comply with national or European legislation, regulations, rules, related self-regulatory organisation standards, and Codes of Conduct applicable to its banking activities;
- reputational risk arises from a negative perception on the part of customers, counterparties, shareholders, investors or regulators that could negatively impact the Group's ability to maintain or engage in business relationships and to sustain access to sources of financing;
- misconduct risk resulting from actions (or inaction) or behaviour of the Bank or its employees inconsistent with the Group's Code of Conduct, which may lead to adverse consequences for our stakeholders, or place the Bank's sustainability or reputation at risk.

The framework relating to the risks of non-compliance, reputation and inappropriate conduct is detailed in Chapter 4.11 *"Compliance risk"*.

4.10.1 ORGANISATION OF OPERATIONAL RISK MANAGEMENT

Governance

The Group operational risk management framework, other than non-compliance risks detailed in Chapter 4.11 *"Compliance risk"* is structured around a three-level system comprising:

- a first line of defence in each core Business Units/Service Units, responsible for applying the framework and putting in place controls that ensure risks are identified, analysed, measured, monitored, managed, reported and contained with the limits set by the Group-defined risk appetite;
- a second line of defence, namely the Operational Risk Department in the Group's Risk Division.

  As such, the Operational Risk Department:

  - conducts a critical examination of the BU/SUs management of operational risks (including fraud risk, risks related to information systems and information security, and risks related to business continuity and crisis management),
  - sets regulations and procedures for operational risk systems and production of cross Group analyses,
  - produces risk and oversight indicators for operational risk frameworks.

  To cover the entire Group, the Operational Risk Department has a central team supported by regional hubs. The regional hubs report back to the department, providing all information necessary for a consolidated overview of the Bank's risk profile that is holistic, prospective and valid for both internal oversight purposes and regulatory reporting.

  The regional hubs are responsible for implementing the Operational Risk Division's briefs in accordance with the demands of their local regulators.

  The Operational Risk Department communicates with the first line of defence through a network of operational risk correspondents in each Business/Service Units.

  Concerning risks specifically linked to business continuity, crisis management and information, of persons and property, the Operational Risk Department carries out the critical review of the management of these risks in connection with the Group Security Division. Specifically, regarding IT risks, the Operational Risk Department carries out the critical review of the management of these risks in connection with the Resources and Digital Transformation Department.
- a third line of defence in charge of internal audits, carried out by the General Inspection and Audit Division.

First and second-level control

The implementation and monitoring of the operational risk management framework is part of the Group's internal control framework:

- level 1 control is performed as part of operations within each SG Group BU/SU/entity, including managerial supervision and operational controls. This permanent control framework is supervised by the Normative Controls Library (NCL), which brings together, for the entire Group, the control objectives defined by the expertise functions, the business lines, in connection with the second lines of defence;
- level 2 control is carried out by dedicated teams in the Risk Division to carry out this mission on operational risks covering the risks specific to the various businesses (including operational risks related to credit and market risks), as well as the risks associated with purchases, communication, real estate, human resources and information system.

Risk related to security of persons and property

Protecting persons and property, and compliance with the laws and regulations governing security are major objectives for Societe Generale Group. It is the mission of the Group Security Division to manage human, organisational and technical frameworks that guarantee the smooth operational functioning of the Group in France and internationally, by reducing exposure to threats (in terms of security and safety) and reducing their impact in the event of crisis.

The security of persons and property encompasses two very specific areas:

- security, which comprises all the human, organisational and technical resources combined to deal with technical, physical, chemical and environmental accidents that can harm people and property;
- safety, which comprises all the human, organisational and technical resources combined to deal with spontaneous or premeditated acts aimed at harming or damaging the Bank with the intent of obtaining psychological and/or financial profit.

The management of all these risks is based on operational risk systems and the second line of defence is provided by the Risk Department.

Risks related to information and communication technology (ICT) and security risks

Given the importance for the Group of its information system and the data it conveys and the continuous increase in the cybercriminal threat, the risks related to information and communication technologies (ICT) and to security are major for Societe Generale. Their supervision, integrated into the general operational risk management system, is steered as the first line of defence by a dedicated area of expertise (Information and Information Systems Security – ISS) and the second line of defence is provided by the Risk Department. They are subject to specific monitoring by the management bodies through sessions dedicated to Group governance (Risk Committee, CORISQ, CCCIG, DTCO) and a quarterly dashboard which presents the risk situation and action plans on the main information and communication technologies risks.

The Group Security Department, housed within the General Secretariat, is responsible for protecting information. The information provided by customers, employees and also the collective knowledge and know-how of the bank constitute Societe Generale's most valuable information resources. To this end, it is necessary to put in place the human, organisational and technical mechanisms which make it possible to protect the information and ensure that it is handled, communicated to and shared by only the people who are authorised to know.

The person in charge of risks related to information and communication technologies (ICT) and security of information systems is housed at the Corporate Resources and Digital Transformation Division. Under the functional authority of the Head of Group Security, he recommends the strategy to protect digital information and heads up the IT Security Department. The IT security framework is aligned with the market standards (NIST, ISO 27002), and implemented in each Business/Service Unit.

Risk management associated with cybercrime is carried out through the tri-annual Information Systems Security (ISS) master plan.

In order to take into account the development of the threat, in particular that related to ransomware, and in line with the Group strategy, the ISS 2021-2023 master plan is structured, with a budget of EUR 650 million over the period 2021-2023, around two pillars that guide actions out to 2023:

- protect the data of our customers and our ability to operate the banking services, by integrating the threats, the requirements of the regulators, and the need to support the Business Units and Service Units in their digital transformation and the evolution of uses that accompanies it. A risk-based approach allows us to concentrate our efforts on the most critical elements and data, in connection with the work of the Security Department cited above. We are preparing to manage a major cyber crisis by improving in particular our detection capacity, our ability to control our IT links with our partners and subsidiaries, and our ability to rebuild the information system;
- increase our operational efficiency by gaining overall consistency, and by increasing our protections and our ability to react. In particular by developing the management of the Cyber Security Department, by optimising our processes and our tools to be able to deploy new protections at constant cost. Finally, by working on the management of human resources in the department, in particular on developing skills and networks of expertise.

At the operational level, the Group relies on a CERT (Computer Emergency Response Team) unit in charge of incident management, security watch and the fight against cybercrime. This team uses multiple sources of information and monitoring, both internal and external. Since 2018, this unit has also been strengthened by the establishment of an internal Red Team whose main tasks are to assess the effectiveness of the security systems deployed and to test the detection and reaction capabilities of the defence teams (Blue Teams) during an exercise simulating a real attack. The services of the Red Team enable the Group to gain a better understanding of the weaknesses in the security of the Societe Generale information system, to help in the implementation of global improvement strategies, and also to train cybersecurity defence teams. CERT works closely with the Security Operation Center (SOC), which is in charge of detecting security events and processing them.

A team at the Resources and Digital Transformation Department is in charge of ensuring the consistency of the implementation of operational risk management systems and their consolidation for IT processes. The main tasks of the team are as follows:

- identify and evaluate the major IT risks for the Group, including extreme risk scenarios (*e.g.* cyberattack, failure of a provider), to enable the Bank to improve its knowledge of its risks, be better prepared for extreme risk scenarios and better align their investments with their IT risks;
- produce the indicators that feed the IT risks monitoring dashboard, intended for management bodies and Information Systems Directors. They are reviewed regularly with the second line of defence in order to remain aligned with the IS and SSI strategy and their objectives;
- more generally, ensure the quality and reliability of all devices addressing IT operational risks. Particular attention is paid to the permanent control system for its IT risks, which is based on the definition of normative IT and security controls and the support of the Group in the deployment of managerial supervision on this topic. As part of the "PCT" program to transform permanent control, the normative controls were reviewed, *i.e.* around thirty controls on IS/SSI subjects. The IT Department monitors the deployment of these controls across the Group, the progress of which is aligned with the objectives set by the Group.

In terms of awareness, a multilingual online training module on information security is mandatory for all internal Group staff and for all service providers who use or access our information system. It was updated in early 2020 in order to incorporate changes to the new Group Information Security Policy. At the end of August 2021, 98% of Societe Generale Group employees who were notified of the training module had performed it.

Risks related to fraud and non-authorised market activities (rogue trading)

The supervision of fraud risk, whether internal or external, is integrated into the general operational risk management framework which allows the identification, assessment, mitigation and monitoring of the risk, whether it is potential or actual.

It is steered in the first line of defence by dedicated expert teams working on fraud risk management, in addition to the teams in charge of operational risk management specific to each of the banking businesses. These teams are in charge of the definition and operational implementation of the means of raising awareness, preventing, detecting and dealing with frauds. The second line of defence is provided by the Operational Risks Department with a fraud risk manager. The second line defines and verifies compliance with the principles of fraud risk management in conjunction with the first line teams, and ensures that the appropriate governance is in place.

Finally, the teams, whether they are in the first or second line of defence, work jointly with teams of experts in charge of information security, the fight against cyber crime, know your client (KYC), anti-money laundering and combating corruption. Likewise, the teams work closely with the teams in charge of credit risk and market risk. The sharing of information contributes to the identification and increased responsiveness in the presence of a situation of proven fraud or weak signals. This active collaboration makes it possible to initiate investigative measures, blocking attempted fraud or initiating the recovery of funds or the activation of associated guarantees and insurance payments in the event of successful fraud.

4.10.2 OPERATIONAL RISK MONITORING PROCESS

The Group's main frameworks for controlling operational risks are as follows:

- collection and analysis of internal operational losses and significant incidents that do not have a financial impact;
- risk and control self-assessment (RCSA);
- oversight of key risk indicators (KRI);
- development of scenario analyses;
- analysis of external losses;
- framework of new products and services;
- management of outsourced services;
- crisis management and business continuity;
- management of risks related to information and communication technologies.

Collection of internal operational losses and significant incidents without any financial impact

Internal losses and significant incidents without any financial impact are compiled throughout the Group. The process:

- monitors the cost of operational risks as they have materialised in the Group and establishes a historical data base for modelling the calculation of capital to be allocated to operational risk;
- learns from past events to minimise future losses.

Analysis of external losses

External losses are operational losses data shared within the banking sector. These external data include information on the amount of actual losses, the importance of the activity at the origin of these losses, the causes and circumstances and any additional information that could be used by other establishments to assess the relevance of the event as far as they are concerned and enrich the identification and assessment of the Group's operational risk.

Risk and control self-assessment

Under the Risk and Control Self-Assessment (RCSA), each manager assesses the exposure to operational risks of its activities within its scope of responsibility, in order to improve their management.

The method defined by the Group consists of taking a homogeneous approach to identifying and evaluating operational risks and frameworks to control these risks, in order to guarantee consistency of results at Group level. It is based notably on Group repositories of activities and risks in order to facilitate a comprehensive assessment.

The objectives are as follows:

- identifying and assessing the major operational risks (in average amount and frequency of potential loss) to which each activity is exposed (the intrinsic risks, *i.e.* those inherent in the nature of an activity, while disregarding prevention and control systems). Where necessary, risk mapping established by the functions (*e.g.* Compliance, Information Systems Security, etc.) contributes to this assessment of intrinsic risks;
- assessing the quality of major risk prevention and mitigation measures;
- assessing the risk exposure of each activity that remains once the risk prevention and mitigation measures are taken into account (the “residual risk”), while disregarding insurance coverage;
- remedying any shortcomings in the prevention and control systems, by implementing corrective action plans and defining key risk indicators; if necessary, in the absence of an action plan, risk acceptance will be formally validated by the appropriate hierarchical level;
- adapting the risk insurance strategy, if necessary.

The exercise includes, in particular, risks of non-compliance, reputational risk, tax risks, accounting risks, risks related to information systems and their security, as well as those related to human resources.

Key risk indicators

Key risk indicators (KRIs) supplement the overall operational risk management system by providing a dynamic view (warning system) of changes in business risk profiles.

Their follow-up provides managers of entities with a regular measure of improvements or deteriorations in the risk and the environment of prevention and control of activities within their scope of responsibility.

KRIs help BU/SU/Entities and the Senior Management proactively and prospectively manage their risks, taking into account their tolerance and risk appetite.

An analysis of Group-level KRIs and losses is presented to the Group’s Executive Committee on a quarterly basis in a specific dashboard.

Analyses of scenarios

The analyses of scenarios serve two purposes: informing the Group of potential significant areas of risk and contributing to the calculation of the capital required to cover operational risks.

These analyses make it possible to build an expert opinion on a distribution of losses for each operational risk category and thus to measure the exposure to potential losses in scenarios of very severe severity, which can be included in the calculation of the prudential capital requirements.

In practice, various scenarios are reviewed by experts who gauge the severity and frequency of the potential impacts for the Group by factoring in internal and external loss data as well as the internal framework (controls and prevention systems) and the external environment (regulatory, business, etc.). Analyses are peformed either at Group level (cross-business scenarios) or at business level.

Governance is established in particular to:

- enable approval of the annual scenarios update program by Senior Management through the Group Risk Committee (CORISQ);
- enable approval of the scenarios by the businesses (for example during the Internal Control Coordination Committees of the BUs and SUs concerned or during *ad hoc* meetings) and a challenge of scenario analyses by LoD2;
- conduct an overall review of the Group’s risk hierarchy and of the suitability of the scenarios by CORISQ.

New product Committees

Each division submits its plans for a new product and services to the New Product Committee. The Committee, jointly coordinated by a representative of the Group Risk Division and a representative of the relevant businesses division, is a decision-making body which decides the production and marketing conditions of new products and services to clients.

The Committee aims to ensure that, before the launch of any product or service, or before any relevant changes to an existing product or service, all types of induced risks (among them, credit, market, liquidity and refinancing, country, operational, legal, accounting, tax, financial, information systems risks as well as the risks of non-compliance, reputation, protection of personal data, corporate social and environmental responsibility risks, etc.) have been identified, assessed and, if necessary, subjected to mitigation measures allowing the acceptance of residual risks.

Management of outsourced services

Some banking services are outsourced outside the Group or within the Group (*e.g.* in our shared service centres). These two subcontracting channels are supervised in a manner adapted to the risks they induce.

The management framework for outsourced services ensures that the operational risk linked to outsourcing is controlled, and that the terms imposed by the Group under the sub-contracting agreement are respected.

The objectives are to:

- decide on outsourcing with knowledge of the risks taken; the entity remains fully responsible for the risks of the outsourced activity;
- monitor outsourced services until they are completed, ensuring that operational risks are controlled;
- map the Group’s outsourcing activities with an identification of the activities and BUs concerned in order to prevent excessive concentrations on certain service providers.

Crisis management and business continuity

Crisis management and business continuity measures aim to minimise as much as possible the impact of potential disasters on clients, staff, activities or infrastructures, and thus to preserve the Group’s reputation and image as well as its financial strength.

Business continuity is managed by developing in each Societe Generale Group entity, organisations, procedures and resources that can deal with natural or accidental damage, or acts of deliberate harm, with a view to protect their personnel, assets and activities and to allow the provision of essential services to continue, if necessary, temporarily in reduced form, then restoring service to normal.

4.10.3 OPERATIONAL RISK MEASUREMENT

Since 2004, Societe Generale has used the Advanced Measurement Approach (AMA) allowed by the Capital Requirements Directive to measure operational risk. This approach, implemented across the main Group entities, notably makes it possible to:

- identify the businesses that have the greatest risk exposures;
- identify the types of risk that have the greatest impact on the Group's risk profile and overall capital requirements;
- enhance the Group's management of operational risks.

Operational risk modeling

The statistical method used by the Group for operational risk modeling is based on the Loss Distribution Approach (LDA) for AMA internal model.

Under this approach, operational risks are modeled using segments, each segment representing a type of risk and a Group core business. The frequency and severity of operational risks, based on past internal losses, external losses, the internal and external environment, and scenario analyses, are estimated and the distribution of annual losses is calculated for each segment. This approach is supplemented by cross-business scenario analyses that measure cross-business risks for core businesses, such as cybercriminality and the flooding of the river Seine.

Aside from the individual risks associated with each segment or cross-business scenario analysis, the model takes into account the diversification between the various types of risk and the core businesses, dependency effects between extreme risks as well as the effect of insurance policies taken out by the Group. The Group's regulatory capital requirements for operational risks within the scope covered by the (AMA) internal model are then defined as the 99.9% quantile of the Group's annual loss distribution.

For some Group entities, notably in retail banking activities abroad, the standard method is applied: the calculation of capital requirements is defined as the average over the last three years of a financial aggregate based on the Product Net Banking multiplied by factors defined by the regulator and corresponding to each category of activity. To make the calculation, all of the Group's business lines are broken down into the eight regulatory activities.

Societe Generale's total capital requirements for operational risks were EUR 3.7 billion at the end of 2022, representing EUR 46 billion in risk-weighted assets. This assessment includes the capital requirement of AMA and Standard perimeters.

Insurance cover in risk modeling

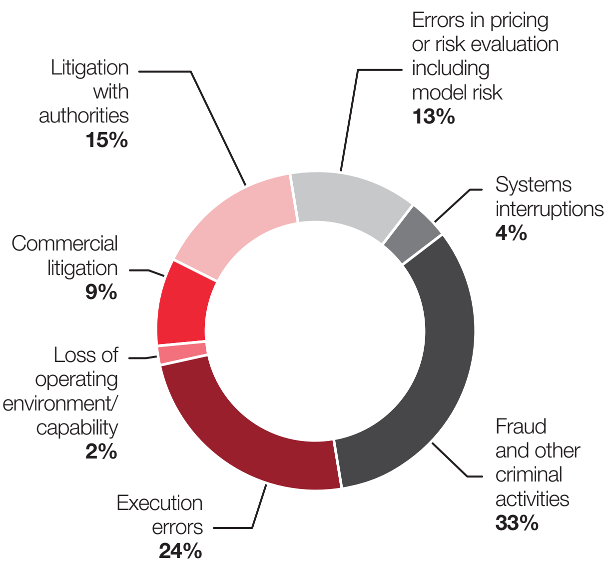
In accordance with regulations, Societe Generale incorporates risk cover provided by insurance policies when calculating regulatory capital requirements for operational risks, within the limit of 20% of said requirements. These insurance policies cover part of the Group's major risks, *i.e.* civil liability, fraud, fire and theft, as well as systems interruptions.

Risk reduction through insurance policies resulted in a 6.5% decrease in total capital requirements for operational risks.

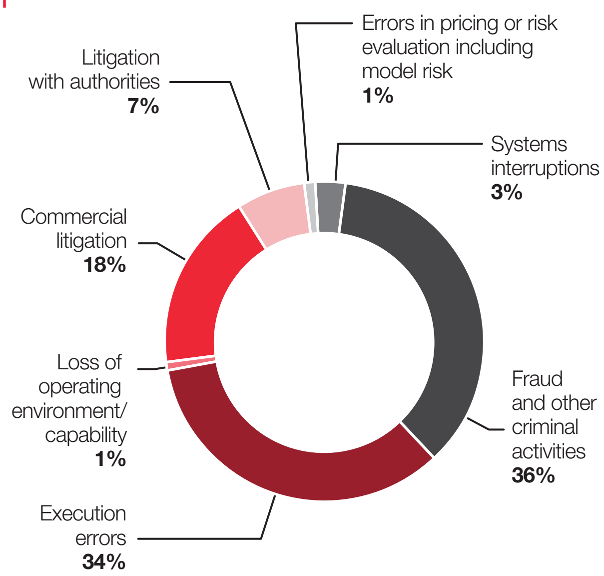
Quantitative data

The following charts break down operating losses by risk category for the 2018-2022 period.

OPERATIONAL RISK LOSSES: BREAKDOWN BY SOCIETE GENERALE RISK EVENT TYPE – AMOUNTS



OPERATIONAL RISK LOSSES: BREAKDOWN BY SOCIETE GENERALE RISK EVENT TYPE – NUMBER OF EVENTS



Over the past five years, Societe Generale's operational risks have, on average, concentrated on five types, accounting for 94% of the Group's total operating losses:

- fraud and other criminal activities represented 33% of the amount of operating losses over the period. They are mainly composed of external frauds on financing files (falsified financial statements by the client, theft or misappropriation of collateral/guarantees, etc.), fraud on manual means of payment (electronic payments, transfers and cheques) and supplier fraud on financed equipment. The level increased slightly in 2022 due in particular to remediation action on old external fraud files;
- execution errors represented 24% of total operational losses, thereby constituting the second leading cause of loss for the Group; The decrease trend that began in 2021, continued in 2022 thanks to the proper execution of the remediation plans;
- litigation with authorities, the third largest category, represented 15% of the Group's operational losses over the period; the net amount of provisions for litigation has decreased in 2022 compared to 2021;
- pricing or risk assessment errors, including model risk, represent 13% of the total amount of losses. The main cases concern the pricing and ALM models;
- commercial disputes represented 9% of total Group operating losses.

The other categories of Group operational risk (activities not authorised on the markets, system interruptions, loss of operating environment/capability) were still relatively insignificant, representing on average 6% of the Group's losses over the 2018 to 2022 period.

4.10.4 RISK-WEIGHTED ASSETS AND CAPITAL REQUIREMENTS

Societe Generale's capital requirements for operational risk are mainly calculated using the Advanced Measurement Approach (AMA) *via* its internal model (97% in 2022).

The amount of RWA on the AMA scope decreased in 2022 (EUR -0.8 billion, *i.e.* -1.7%). This decrease is linked to the update of scenarios analyses, which may trend downward for some categories of operational risk events.

The following table breaks down the Group's risk-weighted assets and the corresponding capital requirements at 31 December 2022.

TABLE 39: WEIGHTED EXPOSURES AND CAPITAL REQUIREMENTS FOR OPERATIONAL RISK BY APPROACH

(In EURm)	31.12.2022				
	Relevant indicator				
Banking activities	31.12.2020	31.12.2021	31.12.2022	Own funds requirements	Risk-weighted assets
Banking activities subject to basic indicator approach (BIA)	0	0	0	0	0
Banking activities subject to standardised (TSA)/alternative standardised (ASA) approaches	1,184	1,337	1,245	103	1,290
Subject to TSA	*1,184*	*1,337*	*1,245*		
Subject to ASA	*0*	*0*	*0*		
Banking activities subject to advanced measurement approaches AMA	21,964	23,980	27,186	3,579	44,733

(In EURm)	31.12.2021				
	Relevant indicator				
Banking activities	31.12.2019	31.12.2020	31.12.2021	Own funds requirements	Risk-weighted assets
Banking activities subject to basic indicator approach (BIA)	-	-	-	-	-
Banking activities subject to standardised (TSA)/alternative standardised (ASA) approaches	1,365	1,437	1,481	193	2,412
Subject to TSA	*1,365*	*1,437*	*1,481*		
Subject to ASA	-	-	-		
Banking activities subject to advanced measurement approaches AMA	23,643	21,964	23,980	3,552	44,394

(1) Historical data including the updates, reflecting some changes in the scope of entities, which occurred during the year.

4.10.5 OPERATIONAL RISK INSURANCE

General policy

Since 1993, Societe Generale has implemented a global policy of hedging Group operational risks through insurance.

This consists of searching the market for the most extensive cover available for the risks incurred and enabling all entities to benefit from such cover wherever possible. Policies are taken out with leading insurers. Where required by local legislation, local policies are taken out, which are then reinsured by insurers that are part of the global program.

In addition, special insurance policies may be taken out by entities that perform specific activities.

A Group internal reinsurance company intervenes in several policies in order to pool high-frequency, low-level risks between entities. This approach contributes to the improvement of the Group's knowledge and management of its risks.

Description of main general risk coverage

Buildings and their contents, including IT equipment, are insured at their replacement value. The guarantee covering acts of terrorism abroad has been renewed.

Liability other than professional liability (*i.e.* relating to operations, Chief Executive Officers and Directors, etc.) is covered. The amounts insured vary from country to country, according to operating requirements.

Description of main risks arising from operations

Insurance is only one of the measures used to offset the consequences of the risks inherent in the Group's activity. It complements the Group's risk management policy.

THEFT/FRAUD

These risks are included in the "Banker's Blanket Bond" policy that insures all the Group's financial activities around the world.

Internal fraud (committed by an employee or by a third party acting with the aid of an employee) and external fraud (committed by a third party acting alone), with the intent to obtain illicit personal gain or to harm the Group, are covered.

PROFESSIONAL LIABILITY

The consequences of any legal action in respect of staff or managers in the Group's professional activities are insured under a global policy.

CYBERATTACKS

A cyber risk insurance policy has been taken out amid an environment not specific to the banking sector which is seeing a rapid development of new forms of crime mainly involving data theft or the compromise or destruction of computer systems.

4.11 COMPLIANCE RISK

Compliance risk is considered a non-financial risk, in keeping with the Group's risk taxonomy.

Acting in compliance means understanding and observing the external and internal rules that govern our banking and financial activities. These rules aim to ensure a transparent and balanced relationship between the Bank and all of its stakeholders. Compliance is the cornerstone of trust between the Bank, its clients, its supervisors and its staff.

Compliance with rules is the responsibility of all Group employees, who must demonstrate compliance and integrity on a daily basis. The rules must be clearly expressed, and staff have been informed and/or trained to understand them properly.

The compliance risk prevention system is based on shared responsibility between the operational entities and the Group Compliance Department:

- the operational entities (BUs and SUs) must incorporate into their daily activities compliance with laws and regulations, the rules of professional best practice and the Group's internal rules;
- the Compliance Department manages the Group's compliance risk prevention system. It ensures the system's consistency and efficiency, while also developing appropriate relationships (liaising with the General Secretariat) with bank supervisors and regulators. This independent department reports directly to General Management.

To support the businesses and supervise the system, the Compliance Department is organised into:

- **Standards and Consolidation teams** responsible for defining the normative system and oversight guidelines, consolidating them at Group level, as well as defining the target operational model for each compliance risk;
- **Departmental/Business Compliance teams** which are aligned across the Group's major business lines (Corporate and Investment Bank, French Retail Banking, International Retail Banking, Private Banking and Corporate Divisions), responsible for the relationship with BU/SUs, including deal flow, advisory, and risk oversight of BU/SUs;
- teams responsible for cross-business functions, including second-level controls.

The Compliance Department is organised into three main compliance risk categories:

- financial security: know your client (KYC) processes; the observance of international sanctions and embargo rules, and anti-money laundering and countering the financing of terrorism (AML/CFT) rules, including the declaration of suspicious activities to the relevant authorities where applicable;
- regulatory risks, which cover in particular: client protection, anti-bribery and corruption, ethics and conduct, compliance with tax transparency regulations (based on knowledge of the customers' tax profile), compliance with corporate social responsibility regulations and Group commitments, market integrity, compliance with prudential regulations in collaboration with the Risk Department, joint coordination with HRCO of the Group's Culture & Conduct issues (conduct in particular);
- data protection, including personal data, in particular client data.

Financial crime risks			Regulatory risks						Data protection & digital
KYC[1]	AML/CTF[2]	Sanctions and embargoes	Client protection	Market integrity	Tax transparency	Anti-Corruption & Bribery, Ethics & Conduct	CSR[3]	Prudential risks	

(1) Know Your Client.
(2) Anti-money laundering and countering the financing of terrorism.
(3) Corporate Social Responsibility.

Compliance has set up an extensive compulsory training programme for each of these risk categories, designed to raise awareness of compliance risks among all or some employees. The training has been completed by high-level employees within the Group.

In addition to its LoD2 function with regard to the aforementioned risks, Compliance oversees the regulatory system for all regulations applicable to credit institutions, including those implemented by other departments, such as prudential regulations.

4.11.1 COMPLIANCE

Financial security

KNOW YOUR CLIENT (KYC)

At the end of 2022, the Group concluded an extensive programme launched in 2018 to rework its KYC functions in order to boost their operational efficiency (*via* the simplification of standards, greater pooling of resources, optimisation of tools and processes) and to improve the client experience. Placed under the responsibility of the Compliance Department, this programme has made it possible to redefine a standardised normative framework country by country in terms of KYC due diligence, to develop new client rating models, and to launch an industrialised system for the screening and processing of negative client news. This allowed the anti-corruption system to be upgraded in line with the requirements of the French anti-bribery agency.

ANTI-MONEY LAUNDERING AND COUNTERING THE FINANCING OF TERRORISM (AML/CTF)

The Group has transposed all the measures related to Directive (EU) 2015/849 on anti-money laundering and counter-terrorism financing (referred to as "the 5th Anti-Money Laundering Directive"), as well as European Regulation 2015/847 on the quality of payment information and the Order of 6 January 2021 on the system and internal controls to fight money laundering and terrorism financing.

The system for the detection of suspicious or unusual transactions continued to be strengthened in 2022 with the roll-out of more sophisticated monitoring tools, the optimisation of scenarios used and the launch of initiatives to switch to new-generation monitoring tools, with priority given to International Retail Banking and Boursorama.

FINANCIAL EMBARGOES AND SANCTIONS

In 2022, the Embargoes/Sanctions teams were hit with the impact of the Russian crisis, in particular the increase in and complexity of the sanction regimes defined by the various jurisdictions (European Union, United States, United Kingdom, etc.) in the first months of the Ukraine war and the disposal of our subsidiary Rosbank.

Societe Generale was able to effectively react to this crisis thanks to the strengthening in recent years of its embargoes/sanctions risk management system, and the exceptional recruitment of additional employees to manage the sharp rise in alerts.

Despite the significant increase in workload for all teams, managing the Russian crisis did not affect the completion of upgrades to the system following agreements entered into with the US authorities in 2018. In accordance with the dismissal of the Deferred Prosecution Agreement, announced in December 2021, the La Fayette programme was officially closed on 1 August 2022. Nevertheless, Societe Generale is still regularly reviewed by an independent consultant appointed by the FED.

Regulatory compliance risk

CUSTOMER PROTECTION

Customer protection is a major challenge for the Societe Generale Group, which is committed to respecting and protecting the interests of its customers.

The prevention of financial vulnerability (early detection), banking inclusion (the right to hold an account) and the removal of insurance taken out on a real estate loan are still priorities. These measures were supplemented by the application of the recent Lemoine law, which stipulates that any request to replace a contract must be processed within 10 days.

Information provided to customers was strengthened with new rules on ESG (Environmental and Social Governance) labelling and designations.

The Group continues to implement significant measures to improve its system in terms of:

- strengthening internal rules regarding key aspects of customer protection (marketing rules – especially in terms of sustainable investment, cross-border sales, customer claims, conflicts of interest, product governance, protection of customers' assets, along with compensation and qualification of employees);
- specific training and increased staff awareness; the importance the Group places on this issue is largely addressed in the Group's Code of Conduct;
- adapting as a matter of necessity existing tools to new regulatory requirements, in particular the Shareholder Rights Directive II (SRD2), applicable as of 2021.

Customer claims

Processing a claim is a commercial act that impacts customer satisfaction. Accordingly, it has received much coverage in the Code of Conduct.

The "Customer claim processing" Group instruction incorporates the recommendations of the national supervisor (French Prudential Supervisory and Resolution Authority – ACPR) and the regulatory requirements (MIF2, DDA and DSP – the Payment Services Directive) relative to the strengthening of customer protection measures at European level. The Bank's businesses have an *ad hoc* governance, an organisation, human resources and applications, formalised procedures, and quantitative and qualitative monitoring indicators.

Independent mediation supplements this internal system. Mediation, a measure aimed at amicable settlement, is brought to customers' awareness on multiple information media, in particular through a permanent notice on the back of bank account statements. Every entity involved is obliged to comply with the independent mediator's decision.

Conflicts of interest

The Group has a clear normative framework in place to prevent and manage conflicts of interest. This framework specifies the principles and mechanisms that have been implemented. This robust system covers three categories of potential conflicts of interest: those that may arise between the Group and its customers or between the Group's customers; those occurring between the Group and its employees (particularly in relation to activities involving an employee's personal interest and/or their professional obligations); and, lastly, those arising between the Group and its suppliers. The system has been supplemented by the annual reporting of conflicts of interest (*Déclaration des Conflits d'intérêts* – DACI) regarding people most exposed to the risks of corruption.

Product governance

Systematic reviews ahead of and during the marketing process ensure compliance with product governance obligations. As product originator, Societe Generale sets up Product Review Committees to ensure the target market has been defined correctly and, if not, to adjust it accordingly. As distributor, Societe Generale checks that the criteria match the customers' situation and communicates with product originators to track products during their life cycle. Societe Generale's investment services policy includes new offers in terms of sustainable finance, the supervision of crypto-assets, and detailed notes on the target markets of the main instruments produced or distributed by each business.

Vulnerable customers

Societe Generale has established practices and usages to comply with legislation vis-à-vis vulnerable customers, in particular customers benefiting from the offer tailored to financially vulnerable customers. To contribute to the national effort to boost the purchasing power of French citizens in challenging financial circumstances, the Group has added to its practices by introducing additional measures in 2019, notably: i) freezing bank fees; ii) capping bank intervention fees for vulnerable clients; and iii) organising follow-up and support suited to the situation of customers experiencing difficulties in the wake of recent events. These measures are closely monitored and covered in action plans aimed at identifying financially vulnerable customers.

MARKET INTEGRITY

The market integrity laws and regulations adopted in recent years have been included in a robust risk hedging system implemented in the Societe Generale Group.

The rules of conduct, the organisational principles and the oversight and control measures are in place and regularly assessed. Moreover, extensive training and awareness-raising programmes are provided to all Group employees.

This system was strengthened in 2022 to keep pace with regulatory developments, in particular:

- to address the escalation in regulatory requirements regarding transaction reporting;
- regarding derivatives, which is an area subject to regulatory changes; combined with business and technological developments, they require constant updates and adjustments to the compliance management system;
- by continuing the IBOR transition to adopt Risk-Free Rates after an important milestone was achieved at the end of 2021 with the discontinuation of LIBOR in EUR, GBP, JPY and CHF.

TAX TRANSPARENCY AND EVASION

Societe Generale Group's principles on combating tax evasion are governed by the Tax Code of Conduct. The Code is updated periodically and approved by the Board of Directors after review by the Executive Committee. It is publicly available *via* the Bank's institutional investor portal (*https://www.societegenerale.com/sites/default/files/documents/Code%20de%20conduite/tax_code_of_conduct_of_societe_generale_group_uk.pdf*).

The five main principles of the Code of Conduct are as follows:

- Societe Generale ensures compliance with the tax rules applicable to its business in all countries where the Group operates, in accordance with international conventions and national laws;
- in its customer relationships, Societe Generale ensures that customers are informed of their tax obligations relating to transactions carried out with the Group, and the Group complies with the reporting obligations that apply to it as bookkeeper or in any other way;
- in its relations with the tax authorities, Societe Generale is committed to strictly respecting tax procedures and ensures that it maintains open and transparent relations to uphold its reputation;
- Societe Generale does not encourage or promote tax evasion for itself, its subsidiaries or its customers;
- Societe Generale has a tax policy in line with its strategy of sustainable profitability and refrains from any operation, whether for its own account or for its customers, whose main purpose or effect is tax motivated, unless this is consistent with the intention of the legislation.

The Tax Department annually presents to the Risk Committee or the Board of Directors the Group's tax policy, including the procedures and systems in place within the Group to ensure that new products and new establishments comply with the Group's tax principles.

The Group is committed to a strict policy with regard to tax havens. No Group entity is authorised in a state or territory on the official French list of ETNCs (*États et territoires non coopératifs* in French)[1] and internal rules have been in place since 2013 to monitor an expanded list of countries or territories,

The Group adheres to the Organisation for Economic Co-operation and Development's (OECD) Transfer Pricing Guidelines and applies the principle of competitive neutrality in order to ensure that its intra-group transactions are made at arm's length conditions and do not lead to the transfer of any indirect benefits. However, local constraints may require deviations from OECD methodologies, in which case the local constraints must be documented.

The Group publishes information on its entities and activities annually on a country-by-country basis (see 2.12 page 67) and confirms that its presence in a number of countries is for commercial purposes only, and not to benefit from special tax provisions. The Group also complies with the tax transparency rules for its own account (CbCR – country-by-Country Reporting).

Societe Generale complies with client tax transparency standards. The Common Reporting Standard (CRS) enables tax authorities to be systematically informed of income received abroad by their tax residents, including where the accounts are held in asset management structures. Societe Generale also complies with the requirements of the United States FATCA (Foreign Account Tax Compliance Act), which aims to combat tax evasion involving foreign accounts or entities held by US taxpayers. The Group has implemented the European Directive DAC6, which will require the reporting of cross-border tax arrangements. Lastly, the Group is studying the new tax transparency standards on digital assets ahead of their upcoming implementation, in particular the CARF (Crypto-Asset Reporting Framework), changes to the CRS standard, and the new European directive in this regard, known as DAC8 (Directive on Administrative Cooperation 8).

Importantly, the account-keeping entities of the Private Banking business line are established exclusively in countries with the strictest tax transparency rules imposed by G20 member countries and the OECD. Assets deposited in Private Banking books are subject to enhanced scrutiny using comprehensive due diligence procedures to ensure they are tax compliant.

In accordance with regulatory requirements, Societe Generale also includes tax fraud in its anti-money laundering procedures.

ANTI-CORRUPTION MEASURES

Societe Generale is fully committed to fighting corruption and has given clear undertakings in this respect by participating in the Wolfsberg Group and the Global Compact.

The Group applies the strict principles included in its Code of Conduct and its "Anti-Corruption and Influence Peddling Code".

(1) Including the European Union blacklist.

Societe Generale's anti-corruption programme is built around the following themes:

- Code of Conduct;
- risk mapping;
- appropriate training at all levels (senior management, exposed persons, all employees);
- control systems;
- accounting procedures;
- evaluation of third parties;
- disciplinary system;
- right to whistleblow.

In this context, processes and tools have been strengthened since 2018 with more staff dedicated to anti-corruption practices within the Group (in particular to carry out client due diligence), the creation of monitoring indicators, and new operational checks to reduce the risk of corruption.

The Group's anti-corruption instructions are revised and expanded every year.

The Societe Generale Group also has several tools at its disposal, such as the tool for declaring gifts and invitations (GEMS), the tool for whistleblowing management (WhistleB), the annual conflict of interest declaration tool (DACI), and the tool for selecting risky manual accounting entries (OSERIS).

Several anti-corruption training measures are implemented on a regular basis, for the benefit not only of employees, but also of persons most exposed to the risk of corruption, accounting controllers, and members of General Management and the Board of Directors.

Third-party (customers, suppliers and associations benefiting from donations or sponsorship initiatives) knowledge procedures have been strengthened.

SUSTAINABILITY RISK

European financial regulations have seen significant changes from a social and environmental perspective, in particular with:

- the entry into force in March 2021 of Regulation (EU) 2019/2088 – SFDR on sustainability-related disclosures in the financial services sector;
- the Taxonomy Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment; and
- the entry into force in January 2022 of the Delegated Regulation of 4 June 2021 supplementing the Taxonomy Regulation.

The Compliance Department is developing the normative framework relative to the European Union regulations on sustainable investment. A dedicated programme is helping the business lines to comply with regulations and is producing deliverables pertaining to normative documentation, training, controls and supervision. An e-learning module on sustainable investment was made compulsory for more than 30,000 Group employees.

Over and above the regulations, the Group is making voluntary, public commitments in this area. To manage the implementation of the environmental and social risk management system and ensure the Group's commitments are upheld, the Compliance Division has taken the following measures:

- developing normative controls;
- deploying e-learning on environmental and social risk management. The training was made compulsory for all employees having a direct or indirect relationship with corporate customers. Moreover, specific workshops were conducted with targeted employees in the Compliance Division to foster an understanding of and compliance with the criteria for applying voluntary commitments;
- defining an environmental and social escalation procedure with respect to corporate customers to set out the criteria requiring business lines to reach out to the Compliance Division and, where applicable, the Responsible Commitments Committee, to connect with a company or during situations likely to present a reputation risk arising from environmental or social factors.

Data protection

PERSONAL DATA PROTECTION

Societe Generale is especially sensitive to personal data protection.

In order to comply with the General Data Protection Regulation (GDPR), Societe Generale Group has significantly strengthened its personal data processing framework.

Across all Group entities, internal instructions and associated procedures in line with local and European regulations define the rules to apply and the measures to take to guarantee the protection and security of customer and staff data. In particular, measures to inform data subjects (customers, employees, shareholders, suppliers, etc.) and process their demands are in place so that such persons can exercise their rights, notably *via* dedicated digital platforms. A personal data security policy has been defined, which fits in with the Group's overall security strategy, especially as regards cybersecurity. Moreover, there has been a specific effort to increase staff awareness *via* dedicated training. Accordingly, the e-learning module was revised in 2022 to be rolled out to all employees working in the relevant entities.

Societe Generale Group has appointed a Data Protection Officer (DPO) in accordance with the applicable regulations. Reporting to the Head of Group Compliance, the DPO is the main contact person for the Personal Data Protection Authority (*Commission Nationale de l'Informatique et des Libertés* – CNIL). The DPO is also responsible for ensuring sound Group compliance for personal data protection. Alongside the network of local DPOs and correspondents throughout the Group entities, the DPO assists them with security issues and personal data usage.

As part of his or her duties, the DPO regularly reviews a number of indicators, notably the number and nature of requests by persons seeking to exercise their rights under GDPR, the internal training completion rate, and the local DPO certification programme.

DATA RECORDS MANAGEMENT

Societe Generale Group is required to archive information that could provide evidence of its activities, in accordance with the laws and regulations applicable in its countries of operation.

Data Records Management (DRM) is defined as all actions, tools and methods aimed at identifying, storing, retrieving and destroying or permanently preserving all information providing evidence of its activities. It ensures the traceability of the Group's activities by preserving records held in compliance with the legal, regulatory, contractual and business rules applicable to the relevant activities, and by destroying them at the end of their retention period, except in specific cases (pre-litigation or litigation retention procedures, for example).

Three DRM principles must be observed and implemented in a proportionate manner for all archived records: integrity, traceability and access.

DRM governance is covered by a specific Group-wide policy.

It is being rolled out gradually as part of a dedicated programme, under the responsibility of the Human Resources, Compliance and Legal Departments, and relies on a network of DRM correspondents.

Other regulatory risks

MANAGEMENT OF REPUTATION RISK

It is coordinated by the Compliance Department, which:

- supports the Compliance Control Officers of the businesses in their strategy for preventing, identifying, assessing and controlling reputation risk;
- develops a reputation risk dashboard that is communicated quarterly to the Risk Committee of the Board of Directors, based on information from the businesses/Business Units and support functions/Service Units (in particular the Human Resources, Communications, Legal, Corporate Social Responsibility and Data Protection Departments).

Moreover, Chief Compliance Officers dedicated to Business Units take part in the various bodies (New Product Committees, *ad hoc* Committees, etc.) organised to approve new types of transactions, products, projects or customers, and formulate a written opinion as to their assessment of the level of risk of the planned initiative, and notably the reputation risk.

CORPORATE COMPLIANCE

In addition to its second-line-of-defence function with regard to the aforementioned risks, the Compliance Department has continued to strengthen the supervision of the Group's regulatory system in coordination with the Risk, Finance and Legal Departments. This oversight relies on the corporate compliance framework, which aims to ensure the Group's compliance with all banking and finance regulations, including those implemented by other departments (control functions or independent expert functions) in areas where Compliance has no dedicated expertise.

Furthermore, the process for reporting prudential non-compliance incidents was strengthened in 2022 with the creation of a new category in the Group's taxonomy, dedicated to prudential regulations and incorporated into the scope of the Compliance Incident Committees.

COMPLIANCE REMEDIATION PLAN IN THE WAKE OF AGREEMENTS ENTERED INTO WITH FRENCH AND US AUTHORITIES.

In June 2018, Societe Generale entered into agreements with the US Department of Justice (DOJ) and the US Commodity Futures Trading Commission (CFTC) to resolve their investigations into IBOR submissions, and with the DOJ and the French Financial Prosecutions Department (*Parquet National Financier* – PNF) to resolve their investigations into certain transactions involving Libyan counterparties.

In November 2018, Societe Generale entered into agreements with the US authorities to resolve their investigations into certain US dollar transactions involving countries, persons or entities subject to US economic sanctions.

As part of these agreements, the Bank committed to enhance its compliance system in order to prevent and detect any violation of anti-corruption and bribery, market manipulation and US economic sanction regulations, and any violation of New York state laws. The Bank also committed to enhance corporate oversight of its economic sanction's compliance programme.

Moreover, the Bank agreed with the US Federal Reserve to hire an independent consultant to assess the Bank's progress on the implementation of measures to strengthen its compliance programme with respect to sanctions and embargoes.

To meet the commitments made by Societe Generale as part of these agreements, the Bank developed a programme to implement these commitments and strengthen its compliance system in the relevant areas, which was officially concluded on 1 August 2022.

On 30 November and 2 December 2021, the US federal court confirmed the termination of legal proceedings by the DOJ, which confirmed that Societe Generale complied with obligations relating to the deferred prosecution agreements (DPA) of June and November 2018. In December 2020, the PNF resolved proceedings against Societe Generale and acknowledged that Societe Generale had fulfilled its obligations with respect to the public interest judicial convention.

UNITED STATES COMPLIANCE REMEDIATION PLAN

On 19 November 2018, Societe Generale Group and its New York branch (SGNY) entered into an agreement (enforcement action) with the NY State Department of Financial Services regarding the SGNY anti-money laundering compliance programme. This agreement requires (i) submitting an enhanced anti-money laundering programme, (ii) an anti-money laundering governance plan, and (iii) the performance of an external audit in 2020.

As background information, on 14 December 2017, Societe Generale and SGNY on the one hand, and the Board of Governors of the Federal Reserve on the other hand, agreed to a Cease-and-Desist order (the "Order") regarding the SGNY compliance programme to adhere to the Bank Secrecy Act ("BSA") and its anti-money laundering ("AML") obligations (the "Anti-Money Laundering Compliance Program"), and regarding some aspects of its know your client (KYC) programme.

This Cease-and-Desist Order signed on 14 December 2017 with the US Federal Reserve supersedes the Written Agreement entered into in 2009 between Societe Generale Group and SGNY on the one hand, and the US Federal Reserve and the New York State Financial Services Department on the other.

On 17 December 2019, Societe Generale SA and SGNY signed an agreement with the Federal Reserve Bank of New York (FRB) regarding compliance risk management. This agreement included the submission and approval by the FRB, followed by the implementation, of (i) an action plan to strengthen supervision by the US Risk Committee of the compliance risk management programme, (ii) an action plan to improve the compliance risk management programme in the US, and (iii) revisions of the internal audit programme concerning compliance risk management audits in the US.

At the end of 2022, Societe Generale had made considerable progress in the delivery of remedial actions.

4.11.2 LITIGATION

The information pertaining to risks and litigation is included in Note 9 to the consolidated financial statements, page 552.

4.12 MODEL RISK

Many choices made within the Group are based on quantitative decision support tools (models). Model risk is defined as the risk of adverse consequences (including financial consequences) due to decisions reached based on results of internal models. The source of model risk may be linked to errors in development, implementation or use of these models and can take the form of model uncertainty or errors in the implementation of model management processes.

4.12.1 MODEL RISK MONITORING

The Group is fully committed to maintaining a solid governance system in terms of model risk management in order to ensure the efficiency and reliability of the identification, design, implementation, modification monitoring processes, independent review and approval of the models used. An MRM ("Model Risk Management") Department in charge of controlling model risk was created within the Risk Department in 2017. Since then, the model risk management framework has been consolidated and structured and is based today on the following device.

Actors and responsibilities

The model risk management system is implemented by the three independent lines of defence, which correspond to the responsibility of the business lines in risk management, to the review and independent supervision and evaluation of the system and which are segregated and independent to avoid any conflict of interest.

The device is as follows:

- the first line of defence (LoD1), which brings together several teams with diverse skills within the Group, is responsible for the development, implementation, use and monitoring of the relevance over time of the models, in accordance with model risk management system; these teams are housed in the Business Departments or their Support Departments;
- the second line of defence (LoD2) is made up of governance teams and independent model review teams, and supervised by the "Model Risk" Department within the Risk Department;
- the third line of defence (LoD3) is responsible for assessing the overall effectiveness of the model risk management system (the relevance of governance for model risk and the efficiency of the activities of the second line of defence) and independent audit of models: it is housed within the Internal Audit Department.

Governance, steering and monitoring

A MRM Committee chaired by the Risk Director meets at least every three months to ensure the implementation of the management system and monitor the risk of models at Group level. Within the second line of defence and the "Model risk" Department, a governance team is in charge of the design and management of the model risk management system at Group level.

As such:

- the normative framework applicable to all of the Group's models is defined, applied when necessary to the main families of models to provide details on the specifics, and maintained while ensuring the consistency and homogeneity of the system, its integrity and its compliance with regulatory provisions; this framework specifies in particular the definition of expectations with regard to LoD1, the principles for the model risk assessment methodology and the definition of guiding principles for the independent review and approval of the model;
- the identification, recording and updating of information of all models within the Group (including models under development or recently withdrawn) are carried out in the model inventory according to a defined process and piloted by LoD2;
- the monitoring and reporting system relating to model risk incurred by the Group in Senior Management has been put in place. The appetite for model risk, corresponding to the level of model risk that the Group is ready to assume in the context of achieving its strategic objectives, is also formalised through statements relating to risk tolerance, translated under form of specific indicators associated with warning limits and thresholds.

Model life cycle and review and approval process

For each model, risk management is based on compliance with the rules and standards defined for the entire Group by each LoD1 player, it is guaranteed by an effective challenge from LoD2 and a uniform approval process.

The need to examine a model is assessed according to the level of model risk, its model family and applicable regulatory requirements. The independent review by the second line of defence is triggered in particular for new models, periodic model reviews, proposals to change models and transversal reviews in response to a recommendation:

- it corresponds to all the processes and activities which aim to verify the conformity of the functioning and use of the models with respect to the objectives for which they were designed and to the applicable regulations, on the basis of the activities and controls implemented by LoD1;
- it is based on certain principles aimed at verifying the theoretical robustness (evaluation of the quality of the design and development of the model), the conformity of the implementation and use, and the relevance of the monitoring of the model;
- it gives rise to an Independent Review Report, which describes the scope of the review, the tests carried out, the results of the review, the conclusions or the recommendations.

The approval process follows the same approval scheme for all models, the composition of governance bodies being able to vary according to the level of model risk, the family of models, the applicable regulatory requirements and the Business Units/Service Units in which model is applicable. Responsible for LoD2, the approval process consists of two consecutive instances:

- the Review Authority which aims to present the conclusions identified by the review team in the Independent Review Report and to discuss, allowing for a contradictory debate between LoD1 and LoD2. Based on the discussions, LoD2 confirms or modifies the conclusions of the Review Report, including the findings and recommendations, without being limited thereto;
- the Approval Authority, a body which has the power to approve (with or without reservation) or reject the use of a model, changes made to the existing model or continuous monitoring of the relevance of the model along the time proposed by the LoD1, from the Independent Review Report and the minutes of the Review Authority.

4.13 ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) RISKS

4.13.1 INTRODUCTION

Definition

Environmental, social and governance (ESG) risks correspond to the risk of negative impacts stemming from current or prospective ESG factors relating to the Group's financing, investment or service activities. Societe Generale applies the concept of double materiality when analysing such risks. This means that in addition to analysing environmental, social and governance materiality, to identify the impact of its activities on the environment and on human rights, it also analyses financial materiality, to identify risks that stand to affect the Group's economic and financial activities as a result of ESG factors.

The Group is exposed to ESG risks not only through its financing, investment and service activities, but also through its direct activities in relation to its buildings, sourcing, etc. It has updated its risk management framework to take these new risks into account and continues to make further adjustments where necessary.

ESG risks are considered factors that can aggravate the traditional categories of risk (credit and counterparty risk, market and structural risk, operational risk, reputational risk, compliance risk, liquidity and funding risk, risks related to insurance activities). They can impact the Group's activities, results and financial position in the short-, medium- and long-term. Accordingly, they are assessed on the same time horizons as for the Group's financial and operational risks.

The individual components of ESG risks can be defined as follows:

- **environmental risks** correspond to the risk of materialisation of environmental factors that may adversely affect the financial performance or solvency of a sovereign or individual entity. Environmental factors are those related to the quality and proper functioning of the natural environment and natural systems. They include factors such as climate change, biodiversity*, energy consumption and waste management;
- **social risks** correspond to the risk of materialisation of social factors that may adversely affect the financial performance or solvency of a sovereign or individual entity. Social factors are those related to the rights, well-being and interests of people and communities. They include factors such as (in)equality, health, inclusiveness, labour relations, workplace health & safety and well-being, human capital and communities;
- **governance risks** correspond to the risk of materialisation of governance factors that may adversely affect the financial performance or solvency of a sovereign or individual entity. Governance factors are those related to governance practices (executive leadership, executive pay, audits, internal control, fiscal policy, Board of Director independence, shareholder rights, integrity, etc.) and to how companies and entities take environmental and social factors into account in their policies and procedures.

The Group added ESG risk factors to its risk taxonomy in 2021 and the associated descriptions were revised in 2022 to include physical and transition risks among environmental factors and to incorporate double materiality. Its definitions are based on the EBA Report on management and supervision of ESG risks for credit institutions and investment firms (published in 2021) and the ECB's Guide on climate-related and environmental risks (published in 2020).

With a view to satisfying the Pillar 3 requirements for qualitative disclosures on ESG risks, this part of Chapter 4 explains how the Group has developed a framework to mitigate such risks. A table of cross-references to the Declaration of Extra-Financial Performance is provided in Chapter 9 (see page 682).

4.13.2 ANALYTICAL APPROACH TO EXTRA-FINANCIAL RISK FACTORS

In addition to the materiality matrix (see Chapter 5, "Dialogue with stakeholders", page 336 and following), which informs the Group's strategic analysis by clarifying its stakeholders' expectations, the Group has conducted a specific assessment to identify its extra-financial risks. Based on the results of this assessment, it has ranked its principal extra-financial risk factors according to two criteria: their potential severity and how likely they are to materialise. In doing so, the assessment considered intrinsic risk, *i.e.* the risk level before any steps are taken to minimise its impact. A time frame was applied to certain risk factors, in that a risk may be perceived as low today but intensify in the future. The methodology and findings of this assessment were submitted to the independent third-party auditor when the assessment was conducted and remain valid for the purposes of this document.

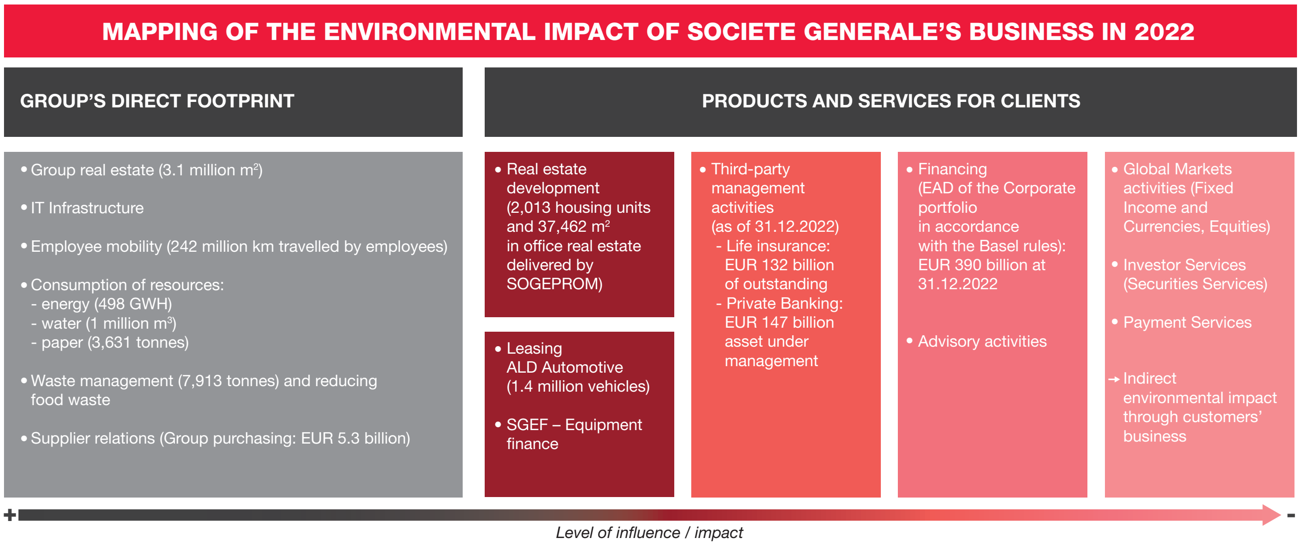
The following intrinsic extra-financial risk factors were identified as being the most significant for the Group:

- IT systems failure, including cybercrime (see Chapter 4, page 258);
- unethical business practices, including corruption, tax evasion and money laundering (see Chapter 4, page 267);
- failure to protect data (see Chapter 4, page 268);
- ESG issues arising in connection with other operational risks or negative stakeholder perception – especially among external stakeholders – and that stand to impact the Group's reputation;
- non-compliance with E&S legislation or the Group's E&S commitments, including non-compliance with labour regulations or health and safety standards (Chapter 5, "Being a responsible employer", page 293 and following).

A number of moderate extra-financial risk factors were also identified:

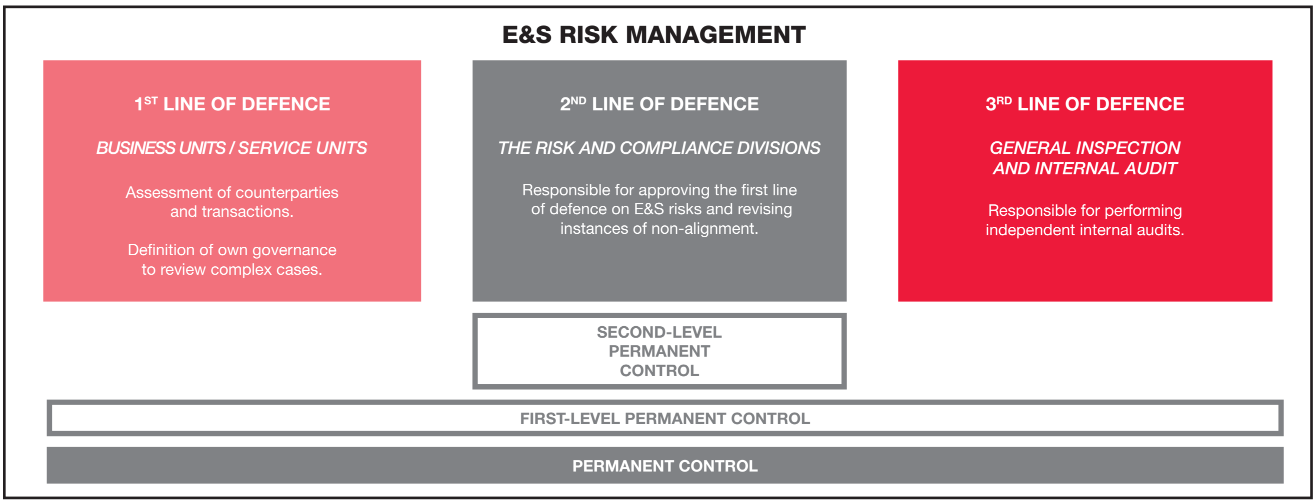
- ESG issues that may affect the Group's credit risk, especially climate-related issues, *i.e.* transition risks and physical risks. These risks could escalate over time and subsequently join the list of more significant risk factors (see Chapter 4, page 280 and following);
- inappropriate employee conduct, *e.g.*, non-compliance with the Group's Code of Conduct and Guidelines (see Chapter 5, "Being a responsible employer", page 293 and following);
- and more specifically in relation to Human Resources management, the risk of a lack of qualified staff (see Chapter 5, "Being a responsible employer", page 293 and following).

Alongside this identification process, the Group has mapped the environmental impact of its activities.



Application of the principles of separation of responsibilities in the lines of defence

Governance of ESG risks was strengthened in 2019 when such risks were included in the Group's normative documentation (see Chapter 3, page 69, Chapter 5, "Incorporating CSR at the highest level of governance", page 343).



The updated normative documentation clearly articulates the roles of the first (BU/SU) and second (Risk and Compliance Divisions) lines of defence and of the CSR Department:

- the BUs and SUs are in charge of deploying the ESG risk management system throughout their respective scopes and must comply with the Group's recommendations regarding counterparty and transaction assessments. They can call on the ESG experts present in other business lines to carry out these assessments for them. Each BU/SU designates its own governance bodies to review complex cases, request guidance and direction from the Head of the BU/SU where necessary and provide input when the Group is updating its ESG standards (see Chapter 3, page 69);
- the Risk and Compliance Divisions are in charge of the second line of defence. As such, they perform level 2 controls on ESG-related alignment, reputational and credit risks and assess the quality of the first line of defence's procedures.

There is also the Responsible Commitments Committee (CORESP), which was set up in 2019 and held six meetings over 2022. The following matters, in particular, were on the agenda at those meetings:

- changes in the Group's standards with regard to managing ESG risks, especially for the oil & gas and tobacco sectors;
- the latest commitments from the Group, such as on biodiversity* preservation and aligning its credit portfolios and internal operations with the Paris Agreement's terms;
- reviews of particularly sensitive clients and transactions from an ESG standpoint.

The Group Risk Committee (CORISQ), for its part, met 18 times over 2022. Since 2017, the CORISQ has conducted regular reviews of extra-financial risks such as IT systems failure (including the risk of cybercrime) and unethical business practices (including corruption, tax evasion and money laundering). It also reviews climate-related risks (as well as the scenario and alignment indicators used to assess these risks and the proportion of the credit portfolio exposed to them) on an annual basis. As part of this annual assessment, the CORISQ looks at the main sector-based alignment and internal monitoring indicators used, the efforts undertaken to improve the assessment methodology, and the regulatory environment for the banking sector. In its capacity as the CORISQ's secretary, the Risk Division can seek advice from the Sustainable Development Department on any CSR-related environmental or reputational matters relevant to the credit portfolio. In a significant development, the CORISQ now looks at environmental factors affecting the Group's credit portfolios when assessing credit risk. Moreover, climate risks regularly appear on the agenda for its meetings with the Board throughout the year (at least quarterly). Regular reporting to the Risk Committee is in place for all such matters. The Risk Committee's Activity Report for the year can be found in Chapter 3, page 98.

4.13.3 MANAGING ESG-RELATED RISKS IN THE GROUP'S ACTIVITIES

ESG risk management is an important factor in the processes governing how Societe Generale conducts business. The Group identifies and assesses its ESG impacts and the associated risks, and then adopts appropriate prevention or mitigation strategies.

4.13.3.1 ESG risk management framework

The Group has a number of internal processes in place (including its client assessment process – see Chapter 4, page 266) to manage its governance risks. These processes are founded on the principles of ethical business conduct and regulatory compliance and include in particular processes for managing embargos and sanctions (see Chapter 4, page 266), allocating resources (see Chapter 4, page 268), ensuring data protection (see Chapter 4, page 268) and tackling terrorism financing (see Chapter 4, page 266), corruption (see Chapter 4, page 267) and tax avoidance (see Chapter 4, page 268).

4.13.3.2 Environmental and Social (E&S) General Principles and sector policies

The E&S General Principles apply to all financial and banking transactions and services provided by Societe Generale entities. They set out the framework applicable to the Group's activities, addressing the potential ESG impact of the associated product and service offerings.

The E&S General Principles were updated in 2021. The latest version, including all Annexes, is available on the Group's corporate website (*https://www.societegenerale.com/sites/default/files/documents/CSR/Environmental-Social-General-Principles.pdf*). The updates included **three statements on major cross-sector issues:**

- human rights (an update of the existing statement);
- the climate (new statement); and
- biodiversity* (new statement).

These statements set out the main reference standards on these issues and include an undertaking from Societe Generale to comply with those standards and encourage its clients to do likewise. They also detail the various initiatives the Group has joined with a view to making these issues a more central component of its economic activities.

The sector policies, referred to as the E&S policies, define the standards that the Group agrees to apply in sectors considered potentially sensitive from an E&S or ethics perspective, based on its mapping of intrinsic E&S risks. The E&S policies are publicly available on the Group's corporate website (*https://www.societegenerale.com/en/responsability/ethics-and-governance*). They cover the following sectors: industrial agriculture and forestry, dams and hydroelectric power, oil and gas, thermal power stations, thermal coal, defence, shipping and civil nuclear power. The E&S General Principles and policies are updated in line with regulatory, scientific or societal developments, peer practices and the Group's strategy.

The E&S policies all follow the same structure: they identify E&S risk factors, list the reference standards applicable to the sector or field in question, specify the scope of the activities covered (subsectors, financial and banking products and services) and may also define criteria in respect of each sector or field for:

- the Group's corporate clients (excluding financial institutions and sovereigns);
- transactions: products and services with a known underlying (for example, asset or project finance);
- securities held on the Bank's own account or on behalf of third parties;
- specific products or services, such as agricultural commodity derivatives.

The policies may include different types of criteria for each of the above-listed categories:

- **E&S exclusion criteria** are designed to exclude from the Group's activities certain types of corporate client, issuer, banking or financial product or specific service or transaction that are associated with underlying practices or activities that are damaging to the environment and/or human rights to such an extent or in such a way that improvement within a reasonable timeframe is not possible;
- **E&S priority assessment criteria** serve to identify priority risk factors requiring a targeted and systematic response as part of the assessment process. Clients that do not satisfy the assessment criteria are granted a reasonable timeframe in which to improve their practices (steps required may include a formal action plan or the signature of contractual undertakings). For specific transactions and projects, satisfying these criteria must be a prerequisite for moving beyond the development phase. When providing dedicated advisory services ahead of project development, the Group must assess the client's commitment to developing a project that will satisfy these criteria;

- **other E&S assessment criteria** are designed to identify other risk factors inherent to the sector in question that also need to be considered as part of an extra-financial assessment, and to set out the associated best practices the Group wishes to promote.

In 2022, as part of its efforts to preserve biodiversity*, the Group committed to refraining from financing projects in the sensitive sectors of oil and gas exploration and production, mining extraction, upstream industrial agriculture, reservoir dams, thermal power plants and shipyards, when located in Ramsar wetlands or IUCN category I-IV areas or on UNESCO World Heritage or Alliance for Zero Extinction sites. The Group also committed to refraining from financing oil exploration and production projects in the Arctic, as well as projects relating to the exploration, production and trading of oil from the Equatorial Amazon. Lastly, Societe Generale engaged with its corporate clients operating in the South American soy and cattle sectors, as well as in the palm oil sector (producers, traders and primary processors), in line with its commitment to curb deforestation (see the Industrial agriculture and forestry sector policy: *https://www.societegenerale.com/sites/default/files/documents/CSR/Industrial-agriculture-and-forestry-sector-policy.pdf*). The Group reviewed all of its clients within these sectors and assessed how closely aligned they were with its policy. As from January 2023, it will only provide financial products and services to those clients committed to:

- pursuing deforestation- and conversion-free activities (throughout their supply chains in addition to at their own level);
- achieving systematic traceability in their value chains;
- reporting annually to the Group on their progress.

This has already led to the Group ruling out the supply of new products and services to a number of clients.

4.13.3.3 Operational implementation procedures

ESG risk management procedures have been in place within the Group for several years for the day-to-day conduct of business. The idea behind the implementation process is to integrate E&S risk management into existing risk management processes, such as transactional, onboarding and periodic client review processes. In this way, ESG concerns are being phased in as part of Business Units' credit and reputation risk management policies and processes. These efforts continued throughout 2022, with the gradual integration of the latest changes into BU and SU processes. The scope of the system in place to manage E&S risks extends across corporate clients, dedicated transactions, products and services and issuers.

Aspects relating to E&S issues are gradually being factored in to all Business Units' credit and reputation risk management policies and processes. There are three main stages to E&S risk management:

- **E&S risk identification:** this step entails identifying whether the counterparty's activities or the transaction with that counterparty could represent an E&S risk. This is done primarily by checking whether the counterparty or its underlying activities are on the E&S exclusion list or the E&S identification list, whether they are the subject of any E&S-related controversy and whether they are covered by a sector policy (some Business Units limit this to sector policies containing exclusion criteria). This process is designed to confirm compliance with the exclusion criteria from the sector policies. In addition to these checks, governance due diligence is conducted as part of KYC procedures and measures to counter corruption, financing of terrorism, tax evasion and money laundering.

  An E&S identification list is updated by in-house experts on a regular basis and sent to all businesses concerned. This internal list details any projects, company, activity sectors or countries that are the object of severe controversy or public campaigns on the part of civil society for E&S reasons, irrespective of whether they are financed by Societe Generale. The purpose of this internal list is to alert the operational teams to potential concerns ahead of the client and transaction review process, so that they can be prepared to carry out a more in-depth E&S assessment of any transactions and clients concerned.

  In addition to the E&S identification list, there is also an exclusion list, which is likewise regularly updated and sent out to the operational teams at least once a year. This internal list indicates companies that have been excluded under the Defence sector policy due to their involvement in the production, storage or sale of controversial weapons, especially anti-personnel mines or cluster bombs. Societe Generale has pledged that it will not knowingly supply banking or financial services to such companies, their parent companies or their subsidiaries.

  The exclusion list is gradually being extended to reflect the new exclusion criteria added to certain E&S policies when they were updated. Companies can also be excluded on a case-by-case basis, for example further to E&S assessments conducted as part of onboarding processes or in relation to processes for certain types of specific activity such as coal, oil sands and Arctic oil. New tools to beef up this risk identification process are being developed and will be added over time to verify exclusion lists, check the sector policies that apply and help identify new negatives;
- **E&S assessment (of counterparties or transactions identified as presenting an E&S risk):** when an E&S risk is identified, the business line assesses compliance with the criteria from the applicable E&S policy(IES) and the Group's other ESG commitments, and weighs up the severity of any E&S controversies. This assessment may include a prospective analysis of these criteria. A policy setting out Group-wide guidelines for assessing adverse environmental and social information was issued in June 2022. Based on the conclusions of the assessment, an E&S opinion is then issued. The opinion may be positive, conditional (subject to contractual conditions, action plans, restrictions) or negative. The time horizon of the assessment depends on the financial transactions in view with the party (short-term: 0–2 years, medium-term: 3–5 years or long-term: > 5 years);
- **E&S actions:** E&S mitigation actions, which are subject to regular monitoring, may be recommended to mitigate the risks identified.

E&S assessments and actions are reviewed by the second line of defence, which will be either the Risk or Compliance Division, depending on the process (a procedure published in October 2021 gives guidelines for escalation to Compliance) and may, where necessary, be mediated by General Management through the CORESP. The Business Units are also phasing monitoring and controls into their E&S risk management processes.

In addition to identifying, assessing and defining actions to mitigate potential negative impacts, these processes also serve to identify counterparties and transactions for positive impact financing regarding sustainable development. This two-prong approach underpins Societe Generale's Sustainable and Positive Impact Finance (SPIF/SPI; see Chapter 5, "Supporting positive transformation", page 325).

To ensure a smooth and systematic roll-out of this E&S risk management framework across the Group, a new compulsory online training module was developed in 2021 for all BUs and SUs covered by the framework. It is available in 11 languages, ensuring that the same content is consistently available to everyone in the Group wherever it operates.

4.13.3.4 Operational implementation in the Group's Business Units

In the **Corporate and Investment Banking** arm, a dedicated team of experts assists the sales teams to assess E&S issues in respect of clients. This E&S analysis was until recently underpinned by a risk-based approach, with in-depth E&S assessments being reserved for clients deemed to be a priority. This situation has evolved since 2020, however, with the aim now being to eventually extend this analysis to all Corporate and Investment Banking clients (excluding financial institutions and sovereigns), regardless of their sector of activity. The purpose is to gain a better understanding of their portfolios so as to be able to support them in transitioning towards sustainable development. Another specific team of experts helps the sales teams assess and better understand the E&S impacts of transactions, which reflects the Group's voluntary commitments, notably its E&S policies and the Equator Principles.

Corporate and Investment Banking has also voluntarily implemented procedures to manage the E&S risks associated with dedicated projects and assets not currently covered by the Equator Principles (as last amended in 2020), namely in capital market transactions (equity or debt), mergers and acquisitions, and acquisition financing. The Group amended the E&S assessment form in its IT systems again in 2022 with updates to optimise the assessment process for transactions and how information is shared with the Risk Division. Over 500 employees across the various regions and business lines concerned were trained in the new process when it entered into effect. A recording of the training session remains available for those who need it.

Throughout 2022, **Private Banking** continued to consolidate and centralise CSR/ESG governance for its entire scope (France, Private Banking Europe and United Kingdom). Measures implemented include i) steps to ensure its investment processes are in compliance with European regulations on sustainable investments (SFDR and MifiD II) and ii) setting up an Ethics Committee for its asset management business. Both these measures are intended to improve E&S risk management through a stronger procedural framework and tighter ESG criteria for its responsible investment activities.

It also also aligned its exclusion policies (which are already applied to its investment universes) to financial assets provided as loan collateral. It should be noted, however, that these policies do not currently apply to ETFs* and that a tolerance threshold of 20% is applied to the share of securities non-aligned with the investment policies in the indices.

As well as the issues it already addressed in 2021, Private Banking also stepped up programmes to strengthen employee awareness of E&S risks:

- nearly 80% of staff attended a selection of training courses on ESG/CSR;
- 30% completed the "Climate Fresco" training to make them more conscious of environmental and climate risks;
- a certification plan for some of its ESG/CSR experts got under way.

French Retail Banking updated and improved its main E&S assessment process for corporate clients, including the operating method for ESG assessments and the format of client assessment forms. The assessment is performed during the client onboarding stage for companies with revenue in excess of EUR 7.5 million and reviewed every year for clients with more than EUR 100 million in consolidated revenue, and at the grant stage for medium-term loans for transactions in excess of EUR 50 million. This scope is set to be gradually expanded between now and 2025. Retail Banking's CSR team tracks progress towards achieving CSR goals and produces metrics, including for ESG risk management.

Within **International Retail Banking,** appointment of E&S experts goes back to 2019 in both of the regional divisions in sub-Saharan Africa, in both structured finance platforms in North Africa, and in the main subsidiaries in Eastern Europe and Asia. These experts support local sales departments and work closely with Sustainable Development Department experts at Group and BU level.

The Group's normative documentation has been transposed into a procedure for the Business Unit covering subsidiaries in Africa and overseas France. E&S experts were on hand to provide training when the procedure was rolled out in these subsidiaries throughout 2022 to guide the training initiatives. A new procedure was also introduced in 2021 for the structured financing platforms in Africa, detailing how their middle offices should manage E&S clauses in contracts.

E&S experts have been tightening up due diligence processes on projects covered by the Equator IV Principles. Through their work and with the help of other in-house experts and training from outside providers such as IBIS Consulting in Africa, these experts also continue to perfect their own skills.

The Group's subsidiaries **in Europe** (BRD, KB) have transposed the Group's normative documentation into their own respective normative documentation, ensuring compliance with local laws. These new procedures were deployed and implemented over the course of 2021. Employees in these subsidiaries were offered training on E&S policies.

Within **Financial Services**, Societe Generale Equipment Finance (SGEF) is in the process of adapting the E&S risk assessment framework to its clients and transactions. SGEF also performs E&S assessments on the main assets it finances, especially those manufactured by Vendor partners. Green financing is a growth area for SGEF and is the subject of regular updates with the other entities.

At **ALD Automotive*,** client E&S risk identification has been part of KYC (know your client) processes for several years, as with all Group entities. Corporate E&S experts conduct in-depth E&S assessments of priority clients. For more information, see ALD's Statement of extra-financial performance: *https://www.aldautomotive.com/Portals/international/Documents/ALD_URD2020_EN_MEL_21-04-27.pdf?ver=2021-04-27-142150-220#page=115*.

KEY INDICATORS FOR E&S RISK ASSESSMENT IN THE BUSINESS UNITS

	2020	2021	2022
For the Group			
Total number of clients (groups or units) that underwent an in-depth ESG assessment	1,015	4,743[(1)]	7,800
Number of people trained in ESG risk management	3,400	41,142[(2)]	38,000
Global Banking & Advisory (GLBA)			
Total number of dedicated transactions that underwent an ESG assessment	118	134	83
o/w transactions covered by the Equator Principles	*66*	*75*	*48*
o/w dedicated transactions assessed as part of Societe Generale's voluntary commitments	*52*	*59*	*35*
Amount of new financing for dedicated transactions having undergone an ESG assessment under the Equator Principles (EP) *(in EURbn)*	4.7	3.8	5.3
Amount of new financing for dedicated transactions having undergone an ESG assessment as part of Societe Generale's voluntary commitments *(in EURbn)*	3.2	3.4	3.2
Number of client groups that underwent an ESG assessment	153	199	296
French Retail Banking			
Number of clients (groups or units) that underwent an in-depth ESG assessment	456	3,813[(1)]	6,912
International Retail Banking			
Number of clients (groups or units) that underwent an in-depth ESG assessment	406	728	592

(1) Change due to the introduction of a follow-up procedure on E&S assessment and identification questionnaires in 2021.
(2) Change due to the introduction of compulsory CSR training for Retail Banking employees in France.

4.13.3.5 Additional E&S risk management processes related to the specific characteristics of certain Group activities

Some businesses, in light of their specific characteristics, implement their own E&S risk management processes in addition to those imposed by the Group on all activities.

Societe Generale Private Banking applies the Societe Generale ESG General Principles to manage ESG risks in its investment solutions. The asset management arm applies both the Group's Coal and Weapons exclusion list and Private Banking's own exclusion list – issuers subject to a particularly severe ESG controversy (MSCI red flags) as well as those with the poorest ESG ratings – for all direct security investments (shares and bonds). The principles apply to all assets under advisory or discretionary management. Private Banking has also applied these same exclusion rules to its advisory services since 2020, *i.e.* it no longer provides advisory on the most controversial or least favourably rated securities, although all investment and disinvestment decisions ultimately lie with the end client. Societe Generale Private Banking's investment policy is publicly available on its website here: (*https://www.privatebanking.societegenerale.com/fileadmin/user_upload/SGPB/PDF/SGPB_Investment_Policy-Sustainability_risk_and_adverse_impacts.pdf*). Following on from its responsible investor approach, Societe Generale Private Banking has a proxy voting policy for voting rights attached to securities held by the collective investment schemes (AIFs and UCITS) it manages. This policy sets out the main principles of corporate governance with which the asset management company agrees to comply, and establishes Societe Generale Private Banking's voting principles on key issues. The Proxy Voting Policy is reviewed annually to consider any legal developments or changes in Corporate Governance Codes and market practices that may have occurred over the year. It is approved by the Internal Governance Committee. The policy is publicly available on the Societe Generale Private Banking website, as is the corresponding policy for the management company, SG29: *https://sgpwm.societegenerale.com/fileadmin/user_upload/sgpwm/slider/SGPWM_-_Proxy_Voting_2021_10.pdf* and (in French) *https://sg29haussmann.societegenerale.fr/fileadmin/user_upload/SG29H/pdf/reglementation/Politique_d_engagement_et_de_vote_2022_SG29_A_Publier.pdf*

In **Insurance activities**, extra-financial risks are managed through the risk management and internal control systems. The aims of these systems are, respectively, to:

- manage risk at all times through identification and assessment, followed by the implementation of appropriate mitigating measures, where necessary;
- prevent malfunctions, ensure the suitability and effectiveness of internal processes, and guarantee the reliability, integrity and availability of financial, prudential and management information. These systems are based in particular on policies approved by the Sogécap Board of Directors which define the principles, processes and procedures implemented, as well as the governance and key metrics, for each type of risk.

More information on risk management and internal control systems can be found on pages 13 *et seq.* of the Solvency Reports on the life insurance business (in French): *https://www.assurances.societegenerale.com/uploads/tx_bisgnews/SFCR_SOGECAP_2021_VF_01.pdf,* and for the non-life insurance activity on pages 18 *et seq.*: *https://www.assurances.societegenerale.com/uploads/tx_bisgnews/SFCR_SOGESSUR_2021_VF_01.pdf.*

4.13.4 INCORPORATING THE ENVIRONMENT IN THE RISK MANAGEMENT FRAMEWORK

4.13.4.1 Introduction

Environment risks are not a new category of risk for the Group, but rather an aggravating factor for existing categories, such as credit risk, market risk, operational risk, insurance risk and liquidity risk. This approach is aligned with current European supervisory and regulatory standards.

These risk classes that are already covered by its risk management framework (credit risk, counterparty risk, market risk, etc.) are detailed in other sections of Chapter 4, "*Risks and capital adequacy*" (p. 161 and following) and relate to the financial materiality of environmental risks.

4.13.4.2 Terminology for environmental risks

The Group uses the risk terminology suggested by the Task Force on Climate-related Financial Disclosure (TCFD) to describe climate, and by extension, environment risks: physical risks and transition risks.

TRANSITION RISK: DEFINITION AND MAIN CATEGORIES

Transition risk refers to the risk of financial losses for an institution as a direct or indirect result of the process of adjustment towards a lower-carbon and more environmentally sustainable economy.

The journey to a low-carbon and more sustainable economy involves major legal, regulatory, technological and market changes to mitigate and adapt to climate change and protect the environment and ecosystems. The exact nature and direction of these developments, as well as how fast they occur, will affect the extent of the financial and reputational risk drivers within these transition risks for organisations. Although the TCFD's recommendations do not specifically mention it, the Group also considers within transition risk the liability risk stemming from people or businesses seeking compensation for losses they may have incurred as a result of physical or transition risk drivers.

Table 35 gives the main identified transition risk categories and their potential financial impact for the Group and its clients (mainly in industries that are carbon intensive or that have a material negative impact on biodiversity* and on ecosystems*).

TABLE 40: TRANSITION RISKS (SHORT TERM - ST): < 1 YEAR, MEDIUM TERM (MT): 1-5 YEARS, LONG TERM (LT): > 5 YEARS

Risk driver	Description of impact	Time horizon
Legal and regulatory	Carbon tax leading to higher operating costs for clients whose operations generate high emissions (as carbon markets grow or broaden in scope) or a significant environmental impact (as laws governing the exploitation of certain resources or the protection of certain ecosystems* are tightened, for example). Costs may also be pushed up by more stringent standards (such as the ban on new diesel and petrol vehicles from 2035 in Europe). All of these contributing factors are set to intensify over time. Stepped up ESG reporting requirements resulting in increased costs for companies and banks (data collection and estimation): ▪ stricter emissions reporting obligations; ▪ upcoming Green Taxonomy reporting (including for banks); ▪ european Non-financial reporting directive and forthcoming directive on corporate sustainability reporting. Potential additional capital requirements for banks for high carbon exposures (the so-called Brown Penalty) could increase the cost of access to finance for clients.	**ST-MT**
Technological	Significant investment needs go hand in hand with the green transition to develop the technologies and innovations to decarbonise the economy, devise new low-carbon products and services and more sustainable production processes. Companies' existing business models, however, may be based on technologies that are likely to be outdated or on the use of energy sources that may become more expensive as a result of policy measures, forcing these companies to adapt to minimize the negative impact and remain competitive.	**ST-LT**
Market	Reduced demand for certain goods and/or services as consumer trends change (for example, growing demand for green financial services or for more durable and sustainable products). Change in clients' revenue mix and sources of revenue that could reduce their overall income (for example, shifting away from oil and gas to renewables as a revenue stream). Asset revaluation (*e.g.* fossil fuel reserves, property assessments, securities valuations) potentially resulting in increased liquidity risks for coal power assets.	
Reputation	Lower demand and revenue for some sectors and stigmatised counterparties, leading to lower revenue for banks that finance these sectors and counterparties.	**ST-LT**

PHYSICAL RISK: DEFINITION AND MAIN CATEGORIES

Physical risk refers to the financial impact of environmental degradation, as well as of a changing climate, including more frequent extreme weather events and gradual changes in climate.

Acute climate-induced physical risks relate to the impacts of extreme events, including the increasing severity of extreme weather events, such as droughts, heat waves, forest fires, cyclones, hurricanes and flooding. Chronic physical risks relate to more long-term shifts in the climate, such as sustained higher temperatures, that may cause sea levels to rise, chronic heat waves, water stress or changes in the nature of the soil and its use.

When it comes to non-climate environmental risks, especially the risks arising from biodiversity* loss and damage to ecosystems, acute physical risks concern the sudden, severe and short-term impacts caused by a specific event. Here, examples include an oil spill or a chemical pollution incident that have an immediate and serious impact on the affected ecosystem*, the species that live in it and the related ecosystem* services. Chronic risks in this category refer to the long-term, gradual and persistent impacts on an affected ecosystem*, the species that live in it and the related ecosystem* services, caused by activities or processes (such as the incremental damage to an ecosystem* caused by urban development or deforestation).

These physical risks may have financial implications for organisations, such as direct damage, supply shocks (to take possession of goods or indirect impacts on the supply chain) or demand shocks (affecting downstream destination markets). An organisation's financial performance may also be affected by changes in water availability, supply and quality, food security, or extreme temperature variations affecting its premises, operations, supply chains, transport needs and employee safety.

Table 36 sets out the main identified physical risk categories and their potential impact for the Group and its clients.

TABLE 41: PHYSICAL RISKS (SHORT TERM - ST): < 1 YEAR, MEDIUM TERM (MT): 1-5 YEARS, LONG TERM (LT): > 5 YEARS

Risk driver	Description of impact	Time horizon
Acute risks	The heightened severity and increasing frequency of extreme or high environmental impact weather events may result in: ▪ reduced revenue or lower output caused by impacts on the value chain (impact on its own assets as production centres, on the supply chain, or on commercial routes) or on end markets; ▪ increased capital costs (*e.g.* to repair damage to facilities); ▪ devaluation of goods as damage increases in frequency; ▪ insurance cost risk, as premiums rise (in line with increasing risk of damage) and insurability of property risk (the property may no longer covered by insurance); ▪ higher adaptation costs on top of the costs of repairing the damage.	**ST-LT**
Chronic risks	Progressive shifts in meteorological conditions (increasing temperatures, rising sea levels, etc.) or in how ecosystems* function could lead to: ▪ reduced revenue or lower output due to the adverse impact on business models and production facilities in some sectors (for example, the impact of rising temperatures on agricultural output or on the number of hours worked in the construction industry); ▪ asset devaluation in affected areas (for example erosion of property value in coastal areas subject to flooding, such as Florida); ▪ higher costs or capital losses following damage to assets and infrastructure (cracks appearing in buildings in coastal erosion areas); ▪ rising costs generated by the need to adapt to incremental climate change and its attendant investment needs – which will only increase over time.	**MT-LT**

4.13.4.3 Incorporating climate risks in the risk management framework

The following two sections present the monitoring of climate risks, the most advanced process concerning environmental risks.

As aggravating drivers for the other risks already addressed by the Group's risk management framework, climate-induced risks are managed based on the existing governance framework and processes according to a standard approach: identification, quantification, definition of risk appetite, risk control and mitigation.

IDENTIFYING CLIMATE-INDUCED RISKS

The model for identifying climate risk drivers derives from the Group's overall risk identification framework. The process applies right across the Group and aims to identify all risks that are or might be material. Comprehensive and holistic, it covers all risk types and all Group exposures.

This is a two-pillar approach to risk identification:

- Risk Management Governance and Core Committees such as the CORISQs or COFI at Group or Business Unit level or the New Product Committees;
- a series of exercises aimed at identifying additional risks.

(See "Risk identification process" and "Risk quantification and stress test system", in section 4.2.2 "Risk appetite – General framework" (page 179) for more information).

The Group performs an annual risk inventory as part of its risk identification process, which takes in a qualitative analysis of the impact of climate risk on each type of risk. Only the most material qualitative and quantitative impacts are given here. This deep dive showed that the impact of climate risk is material:

- in the short-term (one year): on both operational risk and the reputational risk driver;
- in the medium-term: on credit risk, operational risk, non-compliance risk, and business and strategy risk. In other words ESG risk drivers can also impact the reputational risk driver.

The Economic and Sector Studies Department, under the independent supervision of the Group Chief Economist, devised an in-house methodology for identifying transition and physical economic and industrial risks. They are incorporated in the Group's economic scenarios and vulnerability measurement metrics. They are kept under constant review to keep pace with changes in regulations and wider political, economic and technological developments.

Transmission channels are the mechanisms by which ESG risks impact financial risk (such as credit risk, market risk, etc.). They are defined by the EBA as "the causal chains that explain how these risk drivers impact institutions through their counterparties and invested assets". There are different types of transmission channels through which risks materialise. For Group counterparties or the assets held by the Group they may be: lower profitability, lower real estate value, lower household wealth, lower asset performance, increased cost of compliance, and higher legal costs.

Table 37 illustrates how climate-related physical and transition risks can impact the different risk categories (without considering the materiality of these impacts for Societe Generale's businesses).

TABLE 42: IMPACT OF IDENTIFIED CLIMATE-RELATED RISKS ON EXISTING RISK CATEGORIES

Risk	Physical	Transition
Credit and counterparty credit risk	Physical risk could increase the probability of default of clients (retail and corporate clients, sovereigns, financial institutions) by directly causing damage to their assets in affected areas (since production facilities, warehouses, services and decision-making centres can all be vulnerable to the impacts of physical events) or indirectly affecting their business model by disrupting supply chains, trade routes or markets. In the event of default, physical risks could make it even more difficult for the Group to recover part of its exposure, for example because the value of any pledged collateral or recoverable value has been reduced due to a higher flood risk.	Transition risks, especially for sectors affected by low-carbon transition policies (higher carbon prices, for instance), could affect the ability of clients (retail and corporate clients, sovereigns, financial institutions) to generate revenues and meet their financial commitments if they do not take the measures needed to adapt their business models, or if they cannot finance the necessary adaptation measures (such as research and development to develop low-carbon alternatives for products and services). Transition risks could also have an indirect impact on the value of client assets. For example, the value of fossil fuel reserves, such as coal and oil, are likely to fall as economies move to lower-carbon models, creating what are known as "stranded assets", in turn reducing the value of collateral used to secure funding.
	In addition to credit risk (defined above) for Group counterparties, another distinctive characteristic of counterparty credit risk is its dependence on the degree of exposure to that counterparty, a factor that is sensitive to changes in market conditions. A transition or physical risk can have an impact on market sentiment or conditions.	

<table>
<tr><th>Risk</th><th>Physical</th><th>Transition</th></tr>
<tr><td>Market</td><td>Severe and acute physical events may lead to shifts in market sentiment and could result in sudden repricing. For example, hurricanes affecting business premises in certain areas may impact market expectations regarding their ability to generate revenue, and therefore the value of their stock.</td><td>Transition risks arising from regulatory, legal, technological or market sentiment drivers may bring about abrupt repricing of securities and derivatives, cause liquidity to dry up or asset decorrelation. The value and liquidity of products associated with sectors vulnerable to transition risk could reduce over time and assets could become decorrelated from other sectors.</td></tr>
<tr><td>Operational</td><td>Physical events could have an impact on Societe Generale's own sites and on its ability to continue to provide services to its clients.</td><td>Failure to comply with disclosure requirements on transition risk could expose the Group to legal proceedings or fines. Failure to meet public pledges to transition to a low-carbon economy could lead to reputational risk that could stigmatise banks and reduce revenue as clients are displaced. An additional reputational risk could also arise if external stakeholders perceive a commitment as inappropriate or not going far enough.</td></tr>
<tr><td rowspan="2">Insurance</td><td>Increasingly frequent and severe physical events could have an impact on the non-life (fire, accident and general insurance) insurance business.</td><td></td></tr>
<tr><td colspan="2">Physical and transition risks could change the value of the assets in which the premiums collected by the insurance businesses are invested in. Asset devaluation triggered by transition risk could affect the ability of insurance businesses to meet their financial commitments.</td></tr>
<tr><td rowspan="2">Liquidity</td><td>Damage to clients' property caused by increasingly frequent physical events could impact banks' liquidity risk through customers' demands for liquidity to repair the damage. A major weather event that disrupts an important financial services centre or data centre could trigger an operational event that prevents the Group from operating in a key financial market.</td><td>Non-alignment of the Bank's activities with the objectives of the Paris Agreement could have a negative effect on its extra-financial rating. A downgrade could exclude its securities from the investment universe of some asset managers. A regulatory change by a major central bank to impose stricter ESG criteria for eligible collateral (or to introduce a "green factor" into its monetary policy) could cut into the Group's ability to pledge certain assets to that central bank's monetary operations.</td></tr>
<tr><td colspan="2">An abrupt repricing of securities in response to extreme weather events or a sudden shift to a more restrictive carbon policy may reduce the value of banks' high quality liquid assets, thereby affecting liquidity buffers.</td></tr>
<tr><td>Reputation</td><td colspan="2">ESG – especially environmental – concerns have moved ever higher on the agenda for economic stakeholders and public opinion leaders. In the short term, the Bank could be exposed to reputational risk either directly (by failing to deliver on its sustainability promises) or indirectly (the knock-on effect of damage to a client's reputation). Failure to deliver on its sustainability commitments could result in litigation and risk to its image that could cause a negative commercial impact for the Group.</td></tr>
<tr><td>Compliance and legal</td><td colspan="2">The environmental risks considered likely to have a significant impact on compliance risk in the medium to long term are primarily the risk of non-compliance with sustainability commitments. These risks are based on i) risk of non-compliance with laws or not delivering on the Bank's voluntary environmental and social commitments, especially those published in its sector policies; ii) risk of non-compliance with regulations on sustainable investment.</td></tr>
</table>

ESG risks in general and climate change risks in particular are included in the Group-wide process that aim to continuously identify all significant or potentially significant risks. This is a two-pillar approach:

- governance of risk management, which now includes systematic analysis of ESG risks by the Governance Committees, including:
  - the Risk Committees (CORISQ) in the Group or the Business Units,
  - the New Product Committees, which have started to include an impact assessment of climate and environmental risks;
- a series of exercises to identify any additional risks are organised by risk type. These simulations can be triggered by market, sector or macroeconomic developments, regulatory requirements or changes in the business model.

QUANTIFYING CLIMATE RISKS AND CLIMATE STRESS TESTS

Stress testing for climate risk is a valuable tool to assess how resilient institutions are to changes in the market. The set of scenarios includes future developments in the energy transition, carbon emissions trajectories or severe climate events.

The Group has made significant progress in recent years with developing and onboarding of tools and methodologies to include climate risk in its overall stress tests.

In 2020, it voluntarily took part in two pilot stress testing exercises organised by the French Prudential Supervisory Authority (*Autorité de contrôle prudentiel*, ACPR) and the European Banking Authority (EBA).

The Group was also included the ECB's climate risk stress test exercise in the first half of 2022. The European Central Bank designed the first climate resilience stress test covering the European economy to help supervisory authorities and financial institutions to assess the impacts of climate risks on companies and banks over the next 30 years.

Three modules formed the basis of the exercise, including one module stressing credit and market risk under different short- and long-term scenarios and covering both physical and transition risks, as well as questionnaires on operational and reputational risks.

The ECB presented these stress tests as a joint learning exercise aimed at enhancing both banks' and supervisors' capacity to assess this risk. Participation in the exercise and the feedback received from the ECB provided important leverage for the Group to improve how it takes climate risk factors into account in the Group's stress test framework, and to accelerate the development and formal drafting of its methodology.

In 2022, the Group approved the principle of including a climate stress test based on different scenarios in its stress test framework. The stress test should be conducted at least once a year over medium and long time horizons and cover transition and physical risks. It can either be overall or specific to a portfolio.

RISK APPETITE

See "Measures to manage ESG risk" in section 4.2.1 "Risk appetite" (page 179).

In addition, elements relating to sectoral policies are presented in the first part of section 4.13 (273) and on alignment issues in Chapter 5, "Aligning our activities with pathways consistent with a maximum temperature rise of 1.5 °C", pages 319 and following.

GOVERNANCE OF CLIMATE RISK MANAGEMENT AND MITIGATION

The Group uses a range of tools and indicators to measure, manage and mitigate ESG risks:

- alignment measures: the Group has publicly set itself six alignment targets as part of its climate strategy (on coal-fired power and mining, upstream oil and gas, power generation, primary and secondary energy financing, shipping and ALD Automotive);
- tools to assess the climate vulnerability of its counterparties (the Corporate Climate Vulnerability Indicator or CCVI), the industries in which its clients operate (the Industry Climate Vulnerability Indicator or ICVI) and sovereigns (the Sovereign Climate Vulnerability Indicator or SCVI). The CCVI focuses particularly on transition risks, whereas the ICVI assesses both transition and physical risks. The Group uses both the CCVI and ICVI in various sectors (see section 4.13.4.4, "Processes and tools for identifying and managing climate risk" page 284);
- E&S guidelines and general policies: the Group has developed an E&S risk management framework based on its E&S General Principles and sector policies.

The Group has also defined appropriate internal governance structures and decision-making processes to manage its ESG risks and the associated limits and boundaries (see "Application of the principles of separation of responsibilities in the lines of defence" in section 4.13.2: "Analytical approach to extra-financial risk factors" (page 273)) ESG related risks and limits are managed within this framework.

Furthermore, the Group seeks to mitigate climate risks through its commitments (set out in Chapter 5, "Taking action and building a sustainable future together", page 314), its sector policies and risk diversification (both sector and geographical diversification) and the various specific tools it has adopted for such purposes (described in section 4.13.4, "Processes and tools for identifying and managing climate risk").

In 2022, the Group launched a study on how climate and environmental risks could affect the value of assets used as collateral (especially real estate collateral). It rolled out its data collection process for the Energy Performance Certificate (EPC) – a key component in assessing energy transition risk – and circulated guidelines on how this risk should be taken into account when considering whether to grant loans. It is currently in the process of developing tools to identify physical risks too, as well as a method for assessing how they, in turn, can affect the value of collateral. Studies on other types of collateral are slated for 2023.

When it comes to estimating expected credit losses, upwards or downwards adjustments may need to be made to the results obtained using the existing models, based on the sector in question. Where possible in light of the provisioning horizon, a qualitative analysis of the potential impact of climate risks on expected credit losses forms part of the review process for these adjustments (see also Note 3.8, "Impairment and provisions" page 450, in the Notes to the consolidated financial statements included in this Universal Registration Document).

SCENARIOS

Strategic planning requires the use of forward-looking scenarios. It is impossible to predict the magnitude of climate risks and when they might materialise with total certainty, regardless of the region in question. Political and societal choices, as well as future technological developments, can all have an influence. This is why it is important to consider how various situations might affect climate risks and opportunities.

Analysing different scenarios is a way of exploring a series of plausible possible futures in terms of climate change and offers a logical foundation on which to base reasoning and strategy for those possible futures. It is an approach designed to minimise the risk of bias introduced through expert judgements and can help forge connections with existing frameworks as they are built out.

The Department of Economic and Sector Studies has been developing its climate analysis on macro and sectoral impacts for several years and now integrates climate considerations, carbon price and economic policy actions into the economic scenario.

It also plans to strengthen its sector analysis tools in 2023 by working up an in-house sector-based central stress scenario to add to its climate scenarios.

The department has an advisory role too, making recommendations to the Environmental Risk Committee on which scenario is best suited to the latter's various risk assessment exercises.

4.13.4.4 Processes and tools for identifying and managing climate risk

The following processes and tools – currently at varying stages of maturity – all help the Group consider the impact of transition and physical risks on a range of risk factors and portfolios.

CORPORATE CLIMATE VULNERABILITY INDICATOR (CCVI)

The impact of transition risk on the credit risk of Societe Generale's corporate clients has been identified as the Group's main climate risk. It was therefore the first area of focus for the Group when developing its climate risk framework.

In order to assess this impact, the Group gradually incorporated a Corporate Climate Vulnerability Indicator (CCVI) into the credit risk assessments it performs on its most exposed counterparties in particularly vulnerable sectors.

More specifically, the CCVI (designed in 2017) measures the marginal impact of transition risk on a borrower's solvency (looking at their whole group), using a seven-level scale ranging from High Positive to High Negative. It shows how a credit rating is set to evolve over a 20-year period, assessing vulnerability in parallel with the Group's internal rating, which is based on the one-year probability of default. It covers seven different macrosectors: oil and gas, metals and mining, power, automotive, aviation, shipping and French commercial real estate. The CCVI rating for each sector is determined using a decision tree incorporating up to six criteria.

The Group's approach for measuring transition risks was inspired by the United Nations Environment Programme Finance Initiative (UNEP FI), to which the Group contributed in 2018 along with 15 other international banks. In a nutshell, it aims to assess transition risks by quantifying the marginal impact of a given climate scenario on the credit rating of borrowers in certain priority sectors, assuming they do not implement any adaptation measures. The climate scenario used is approved by the Environmental CORISQ each year based on a recommendation from the Economic and Sector Studies Department.

A specific governance framework has been developed for transition risk assessment. The first line of defence (LOD1) calculates a borrower's CCVI using the above methodology and can adjust the assessment process (and the resulting CCVI) in light of the borrower's specifics. The Risk Division, as second line of defence (LOD2), then validates that CCVI. The CCVI is reviewed once a year, at the same time as the internal rating. Moreover, the CORISQ annually reviews how the CCVI is being used and the results from the eligible regions.

The CCVI pinpoints clients that are vulnerable to transition risks, prompting a review of their transition strategies. When a borrower is identified as being vulnerable or highly vulnerable, the client relationship manager discusses their transition risk strategy with them before issuing an opinion. When a borrower has long-term exposure, the financing risk at maturity is an important consideration, as is the timeliness of their strategic shift in light of the relevant scenario. If the borrower is too slow to adapt, they could find themselves struggling to raise sufficient liquidity to finance their transformation plans.

The Economic and Sector Studies Department is currently working on a new methodology for the CCVI and ICVI (Industry Climate Vulnerability Indicator) with the aim of: (i) extending the sector coverage (to include all Corporate client sectors, except for financial entities), (ii) taking companies' climate strategies into account, and (iii) including more quantitative data to back up the experts' opinions.

INDUSTRY CLIMATE VULNERABILITY INDICATOR (ICVI)

The Industry Climate Vulnerability Indicator (ICVI) assesses the ability of the industry sectors covered to withstand the consequences of climate-related risks (physical and transition risks) and to adapt to moderate potential damage. This initial assessment indicates how vulnerable each sector is to the physical and transition risks of climate change, making it possible to identify those that are most at risk but also those that stand to gain from the situation. Each sector is awarded a score for physical and transition risks, adding to the information gleaned through other sector assessments.

Physical and transition risks affect many different components of a counterparty's business ecosystem, including the macro-environment and relevant government agencies, its supply chains, operations and assets and the market. When assessing an industry sector's vulnerability to physical and transition risks, the Group therefore considers a long list of factors, including those set out below.

To ensure that it does not underestimate the risks, the Group bases each sector's final score on those companies within that sector found to have the least well developed climate strategies.

Panels and financial quantifications of risk are reviewed where possible, but reporting on climate-related financial data and risk assessments is not yet widespread. With future developments in climate-related reporting standards, the Group expects to be increasingly able to rely on quantitative analysis when updating its assessments. At this stage, however, the process is primarily based on expert knowledge of each individual sector.

The ICVI's seven-level scale, ranging from High Positive to High Negative, indicates the impact of physical and transition climate risks for a given counterparty.

TABLE 43: FACTORS CONSIDERED IN THE INDUSTRY CLIMATE VULNERABILITY ANALYSIS

	Sensitivity	Adaptability
Macro-environment	▪ Economic dependence on sectors exposed to climate risk ▪ Economic dependence on emissions-intensive sectors ▪ Dependence on subsidies ▪ Regulated market	▪ Flexibility in fiscal and monetary support policies ▪ Degree of development
Supply chain	▪ Supplier's natural resource intensity ▪ Supplier's emissions intensity ▪ Supplier's ability to pass on costs	▪ Producer's ability to make changes in its supply chains ▪ Producer's ability to switch to low-carbon suppliers or inputs
Operations and assets	▪ Impact of weather conditions and natural resources availability/price on production (productivity, yields, costs) ▪ Suitability of engineering & design for adverse weather conditions ▪ Producer's emissions intensity ▪ Asset's capital intensity ▪ Insurance availability and coverage	▪ Producer's capacity (technical and financial) to adapt facilities for operation in adverse weather conditions ▪ Potential for and affordability of producer's emissions reductions ▪ Producer's capacity (technical and financial) to develop new products/technologies
Market	▪ Weather-dependent consumption ▪ Availability of alternative low-carbon products or services ▪ Market elasticity on price ▪ Diversification in sales ▪ Consumption emissions intensity	▪ Producer's capacity to shift customer base ▪ Producer's capacity (technical and financial) to develop new low-carbon products/technologies ▪ Producer's ability to pass on costs

SOVEREIGN CLIMATE VULNERABILITY INDICATOR (SCVI)

The Sovereign Climate Vulnerability Indicator (SCVI) expresses how vulnerable a country is to climate-related risks, with a view to assessing the direct impact on the associated country risk, *i.e.* on the country's ability and willingness to honour its external debt commitments.

Developed in-house, the SCVI assesses vulnerability to both physical and transition risks and is designed for use with a range of different climate change scenarios. It is based on publicly available and well recognised data sources (World Bank, Food and Agriculture Organization, etc.). For each variable, countries are ranked from least vulnerable (0) to most vulnerable (1) and the indicator is then calculated as an average of these rankings. Data availability and frequency of updates remains an issue; as more data become available, the scope of the SCVI will be extended accordingly. At present, it covers 114 countries, representing 96% of the global economy measured by GDP and 88% of the global population. Countries not covered are those for which data are not currently available.

- The physical risk score ranks countries according to their vulnerability to both extreme weather events and physical changes due to rising global temperatures – *i.e.* climate-related issues that are likely to adversely impact their public and external finances. The data taken into account when establishing this score include, for example, data on the country's shared water resources and on the proportion of its population living less than five metres above sea level.
- The transition risk score ranks countries according to their vulnerability to the risks associated with shifting to a lower-carbon economy, which could adversely affect public and external solvency in two ways: (i) due to the cost associated with such a shift, and (ii) due to the opportunity cost of stranded assets, which may translate into lower foreign exchange revenues for instance, dragging down a country's external metrics. The data taken into account when establishing this score include, for example, data on the country's dependency on energy imports and on how carbon intensive its economy is.

IDENTIFYING HOW PHYSICAL RISK AFFECTS CREDIT RISK, USING SCENARIO ANALYSIS

The Group has opted to focus on developing its own in-house tools to identify physical climate-related risks. Its R&D work on the impacts physical risks can have on its portfolios began with the French retail mortgage portfolio, where it can pinpoint the precise location of the assets financed. It is much harder to locate all assets, facilities and sites owned by the Group's corporate borrowers, as explained below.

The Group's initial assessment of the impact of physical risk on its French mortgage loan portfolio culminated in a special study submitted to the CORISQ back in 2018. In this study, the Group estimated the total value of its residential mortgage loans exposed to the extreme physical events that represent the biggest threats to property. It did so by comparing the location of the properties financed to a map showing the areas most at risk of drought, flooding and storm surges. It also developed a proprietary web application to show exactly which places are most at risk of these extreme events (with a level of specificity ranging from *départements* down to individual municipalities).

In 2021, the Group updated its study for the first time, integrating the latest data as well as historical data and adding forest fires to the list of extreme events considered. It also adapted its web application accordingly, adding in corresponding new features.

In 2022, the Group further developed its physical risk assessment tools. The study now covers a wider geographical scope, including the rest of Europe in addition to France. The focus is on the most extreme events, especially drought, flooding and forest fires. New models have been developed to estimate the risk of future droughts, flooding and forest fires over various different time horizons, based on the IPCC's Representative Concentration Pathway (RCP) scenarios (using RCP 4.5 as the benchmark scenario and RCP 8.5 as the worst-case scenario). And by laying forecasting maps over a map showing the location of its counterparties' assets, the Group can now identify at a glance the types and level of physical risk to which a given company is exposed in France.

The Group also took part in the ECB's stress tests, gaining valuable insight for its study on the physical risks affecting its Corporates portfolio (see "Quantifying climate risks and climate stress tests", page 282).

TREATING PHYSICAL RISK AS PART OF THE GROUP'S OPERATIONAL RISK

Societe Generale defines operational risk as the risk of losses resulting from human error, external events, or inadequacies or failures in processes or systems. It assesses the physical risks to its assets and operations as part of its operational risk monitoring. The Group performs analysis region by region and the results feed into its business continuity plans (BCPs) designed to address local risks. A climate event could impact some or all of its facilities and human or technical resources. The Group has thus developed an approach to assess how climate change could affect its most sensitive sites and data centres by increasing the risks of flooding, heatwaves and black-outs, as well as the consequences of such events (for staff, buildings and IT) as covered by its existing BCPs. For certain specific locations, the Group's assessment includes additional scenarios, such as typhoons and heavy rains in Hong Kong, or hurricanes and snowstorms in New York. Some of these scenarios (such as flooding from the Seine in France or flooding of Chennai in India) are included in the internal models used to calculate operational risk capital requirements.

DATA ISSUES

Data and data analysis are key in enabling financial institutions to identify and manage climate risks. High quality data are a prerequisite to successfully quantifying and assessing such risks.

The Group gathers data from various sources: counterparties, public databases, research institutes and data providers. It is continually striving to expand its supplier base (with a view to obtaining better data on certain sectors) and adopt the right data collection processes (especially for energy performance certificates) so as to achieve optimal data coverage.

However, the challenges remain significant in terms of improving the completeness and quality of the data. To a certain extent, the Group is limited by what its corporate counterparties choose to report.

The application of proxies also remains necessary in certain cases in the event of data not being available.

4.13.4.5 Biodiversity and nature risks

Biodiversity plays a key role in regulating the Earth's system. When it is threatened, this in turn poses a threat to our planet's habitability (NGFS, 2022). From a financial stability perspective, there are two main ways in which biodiversity loss poses a potentially significant threat:

- first, economic activity and financial assets are dependent upon the ecosystem services provided by biodiversity and the environment: this raises the prospect ofphysical risks to finance if these services are undermined;
- second, economic activity and financial assets in turn have impacts on biodiversity and could therefore face risks from the transition to a naturepositiveglobal economy.

The Group has already begun looking into its risks in relation biodiversity and nature.

Subsequently, the ambition is to set up an industrial biodiversity vulnerability indicator (Industry Biodiversity Vulnerability Index – IBVI). This new indicator will follow the same approach as the ICVI and will be introduced in 2023.

(See also Section 5.2.1.1, "Taking action and building a sustainable future together" (page 312) and section "Biodiversity" (page 318)).

4.14 OTHER RISKS

4.14.1 RISK RELATED TO INSURANCE ACTIVITIES

The Group is also exposed to a variety of risks linked to this business through its insurance subsidiaries. In addition to balance sheet management risks (interest rate, valuation, counterparty and exchange rate risk), these risks include premium pricing risk, mortality risk and the risk of an increase in claims.

Management of insurance risks

There are two main types of insurance risks:

- underwriting risks, particularly risk through life insurance, individual personal protection and non-life insurance. This risk can be biometrical: disability, longevity, mortality, or related to policyholders' behaviour (risk of lapses). To a lesser extent, the Insurance business line is also exposed to non-life and health risks. Such risks can come from pricing, selection, claims management or catastrophic risk;
- risks related to financial markets and ALM: the Insurance business line, mainly through life insurance on the French market, is exposed to instabilities on the financial markets (changes in interest rates and stock market fluctuations) which can be made worse by policyholder behavior.

Managing these risks is key to the Insurance business line's activity. It is carried out by qualified and experienced teams, with major bespoke IT resources. Risks are monitored and regularly reported, they are framed by risk policies validated by the Board of Directors of each entity.

Risk management techniques are based on the following:

- heightened security for the risk acceptance process, with the aim of guaranteeing that the price schedule matches the policyholder's risk profile and the guarantees provided;
- regular monitoring of indicators on product claims rates in order to adjust certain product parameters, such as pricing or the level of guarantee, if necessary;
- implementation of a reinsurance plan to protect the business line from major/serial claims;
- application of policies on risk, provisioning and reinsurance.

Management of risks linked to the financial markets and to ALM is an integral part of the investment strategy as long-term performance objectives. The optimisation of these two factors is highly influenced by the asset/liability balance. Liability commitments (guarantees offered to customers, maturity of policies), as well as the amounts booked under the major items on the balance sheet (shareholders' equity, income, provisions, reserves, etc.) are analysed by the Finance and Risk Departments of the Insurance business line.

Risk management related to financial markets (interest rates, credit and shares) and to ALM is based on the following:

- monitoring short- and long-term cash flows (match between the term of a liability and the term of an asset, liquidity risk management);
- particular monitoring of policyholder behaviour (redemption);
- close monitoring of financial markets;
- hedging against exchange rate risks (both rising and falling);
- hedging downside equity risk;
- defining thresholds and limits per counterparty, per issuer rating and assets class;
- stress tests, the results of which are presented annually at entities' Board of Directors' meetings, as part of the ORSA Report (Own Risk and Solvency Assessment), transferred to the ACPR after approval by the Board;
- application of policies related to ALM and investment risks.

Insurance risk modeling

The models are reviewed by the Insurance Risks Department, which is the second line of defence in the context of model risk management. The review works relate to the theoretical robustness (evaluation of the quality of design and development) of the models, the use of the model, the conformity of the implementation and the continuous monitoring of the relevance of the model over time. The independent review process ends with (i) a report describing the scope of the review, the tests performed, the results of the review, conclusions or recommendations and by (ii) validation Committees. The model control system gives rise to recurring reporting to the appropriate bodies.

4.14.2 INVESTMENT RISK

The Group has limited appetite for financial shareholdings in proprietary private equity operations. The types of acceptable private equity operations chiefly involve:

- commercial support for the network through the private equity business of the Group's retail banking networks in France and certain foreign subsidiaries;
- shareholdings in innovative companies, either directly or through private equity funds;
- shareholdings in financial services companies such as Euroclear and Crédit Logement.

Private equity investments are managed directly by the networks concerned (the Group's retail bank in France and foreign subsidiaries) and are capped at EUR 25 million. Any investments above this threshold must be approved by the Group Strategy Department based on a file submitted by the Business Unit in conjunction with its Finance Department. The file must set out arguments justifying an investment of the allotted size, with details of:

- the projected outcome;
- the expected profitability based on the consumption of the associated capital;
- the investment criteria (typology, duration, etc.);
- the risk analysis;
- the proposed governance.

The Group's General Management must approve the investment amount if it exceeds EUR 50 million and must base its decision on the opinion delivered by the Strategy Department, the Finance Department, the General Secretariat and the Compliance Department. At least once a year, the relevant Business Unit must submit a status report to the Strategy Department tracking the operations and the use of the allocated investment amount.

Other private equity minority investments undergo a dedicated validation process for both the investment and divestment phases. They are approved by the Heads of the Business Units and the entities concerned, by their Finance Department and the Strategy Department. Approval must also be sought from the Group's General Management for amounts over EUR 50 million, and from the Board of Directors for amounts exceeding EUR 250 million. These files are assessed by the Strategy Department with the assistance of experts from the Services Units and Business Units involved in the operation, comprising at least the Finance Department, the General Secretariat's Legal and Tax Departments and the Compliance Department. The assessment is based on:

- a review of the proposed shareholding;
- the context of the investment and the reasons for going ahead with it;
- the structuring of the operation;
- its financial and prudential impacts;
- an evaluation of the identified risks and the resources employed to track and manage them.

4.14.3 RISK RELATED TO OPERATING LEASING ACTIVITIES

Risk related to operating leasing activities is the risk of management of the goods leased (including the risk on residual value mainly, and risk on the value of the repair, maintenance and tires to a lesser extent), excluding the operational risk.

Residual value risk

Through its Specialised Financial Services Division, mainly in its long-term vehicle leasing subsidiary, the Group is exposed to residual value risk (where the net resale value of an asset at the end of the leasing contract is less than expected).

RISK IDENTIFICATION

Societe Generale Group holds, inside its ALDA Business Units (automobile leasing activity) cars on its balance sheet with a risk related to the residual value of these vehicles at the moment of their disposals. This residual value risk is managed by ALD Automotive (ALDA).

The Group is exposed to potential losses in a given reporting period caused by (i) the resale of vehicles associated with leases terminated in the reporting period where the used car resale price is lower than its net book value and (ii) additional depreciation booked during the lease term if the expected residual values of its vehicles decline below the contractual residual value. The future sales results and estimated losses are affected by external factors like macroeconomic, government policies, environmental and tax regulations, consumer preferences, new vehicles pricing, etc.

ALDA gross operating income derived from car sales totaled EUR 747.6 million at 31 December 2022 versus EUR 437.7 million at 31 December 2021.

RISK MANAGEMENT

The residual value setting procedure defines the processes, roles and responsibilities involved in the determination of residual values that will be used by ALDA as a basis for producing vehicle lease quotations.

A Residual Value Review Committee is held at least twice a year within each operating entity of ALDA. This Committee debates and decides residual values, taking into account local market specificities, documenting its approach, ensuring that there is a clear audit trail.

A central ALDA team dedicated to control validates the proposed residual values prior to their being notified to the operating entities and updated in the local quotation system. This team informs ALD's Group Finance Director and Risk Manager in case of disagreements.

Additionally, the fleet revaluation process determines an additional depreciation in countries where an overall loss on the portfolio is identified. This process is performed locally twice a year for operating entities owning more than 5,000 cars (once a year for smaller entities) under the supervision of the central team and using common tools and methodologies. This depreciation is booked in accordance with accounting standards.

4.14.4 STRATEGIC RISKS

Strategic risks are defined as the risks inherent in the choice of a given business strategy or resulting from the Group's inability to execute its strategy. They are monitored by the Board of Directors, which approves the Group's strategic trajectory and reviews them at least once a year. Moreover, the Board of Directors approves strategic investments and any transaction (particularly disposals and acquisitions) that could significantly affect the Group's results, the structure of its balance sheet or its risk profile.

Strategic steering is carried out under the authority of General Management, by the General Management Committee (which meets weekly without exception), by the Group Strategy Committee and by the Strategic Oversight Committees of the Business Units and Service Units. The composition of these various bodies is set out in the Corporate Governance chapter of the present document, Chapter 3 (see pages 69 and following). The Internal Rules of the Board of Directors (provided in Chapter 7 of the present document, at page 650) lay down the procedures for convening meetings.

4.14.5 CONDUCT RISK

The Group is also exposed to conduct risk through all of its core businesses. The Group defines conduct risk as resulting from actions (or inaction) or behaviours of the Bank or its employees, inconsistent with the Group's Code of Conduct, which may lead to adverse consequences for its stakeholders, or place the Bank's sustainability or reputation at risk.

Stakeholders include in particular the clients, employees, investors, shareholders, suppliers, the environment, markets and countries in which the Group operates.

See also "Culture & Conduct programme" (see page 184).