Risk management

The sections marked by a grey line in the left margin form part of the Group's audited financial statements. Please refer to Pillar 3 and Other Regulatory Disclosures for other risk disclosures.

1 Risk overview

Business and strategic risk

Overarching risk arising from adverse business and economic changes materially affect DBS' long-term objectives. This risk is managed separately under other governance processes.

Read more about this on page 71.

Credit risk

Risk arising from borrowers or counterparties failing to meet their debt or contractual obligations.

Read more about this on page 79.

Market risk

Risk arising from adverse changes in interest rates, foreign exchange rates, equity prices, credit spreads and commodity prices, as well as related factors.

Read more about this on page 86.

Liquidity risk

Risk that arises if DBS is unable to meet financial obligations when they are due.

Read more about this on page 88.

Operational risk

Risk arising from inadequate or failed internal processes, people or systems, or from external events. It includes legal risk, but excludes strategic and reputational risk.

Read more about this on page 92.

Reputational risk

Risk that arises if our shareholder value (including earnings and capital) is adversely affected by any negative stakeholder perception of DBS' image. This influences our ability to establish new relationships or services, service existing relationships and have continued access to sources of funding. Reputational risk usually occurs when the other risks are poorly managed.

Read more about this on page 94.

2 Risk-taking and our business segments

As we focus on Asia's markets, we are exposed to concentration risks within the region. We manage this by diversifying our risks across industries and individual exposures. In addition, DBS relies on the specialist knowledge of our regional markets and industry segments to effectively assess our risks. The chart below provides an overview of the risks arising from our business segments. The asset size of each business segment reflects its contribution to the balance sheet, and the risk-weighted assets (RWA) offer a risk-adjusted perspective.

Refer to Note 45 to the financial statements on page 179 for more information about DBS' business segments

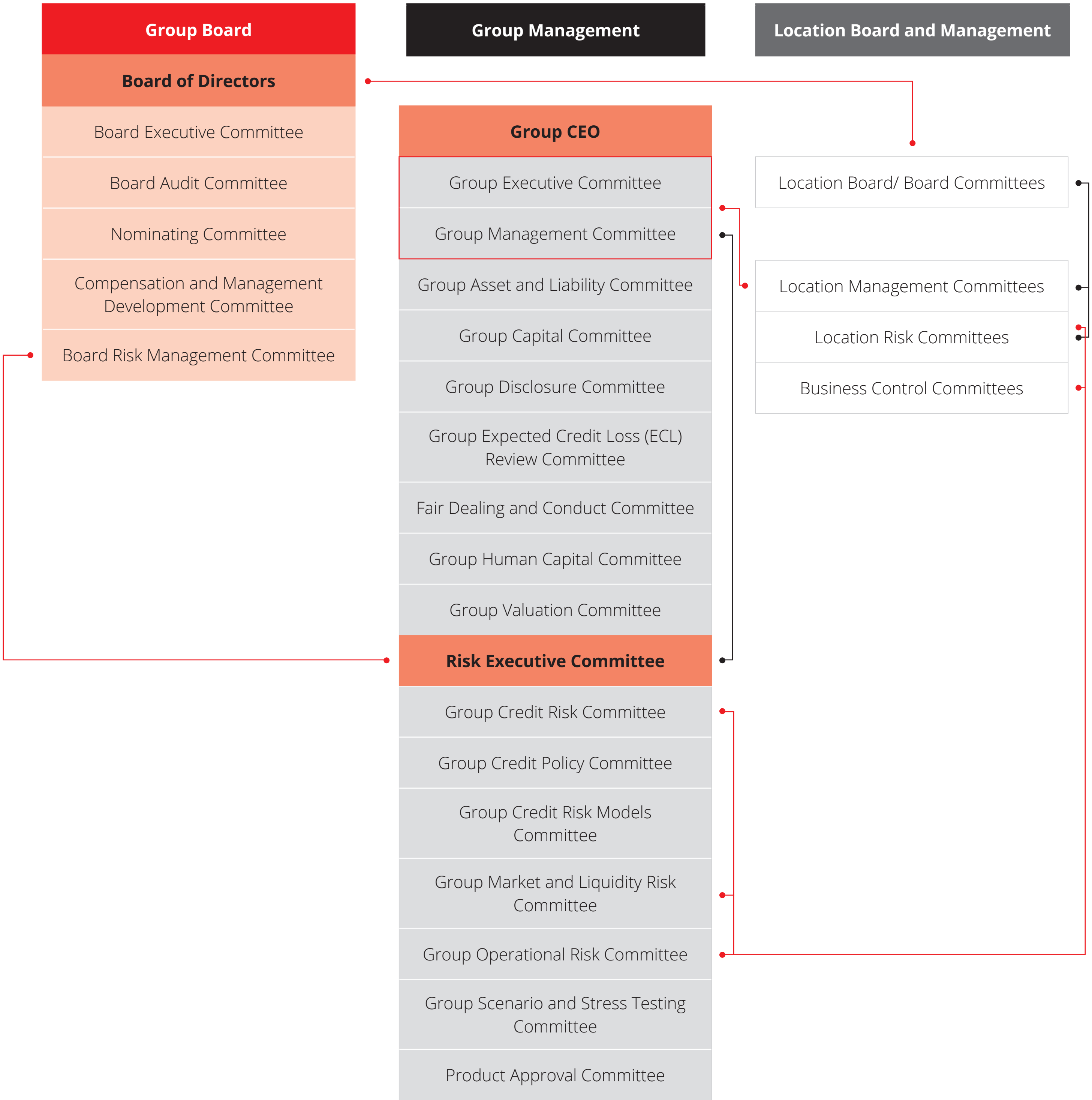
SGD million	Consumer Banking/ Wealth Management	Institutional Banking	Treasury Markets	Others[a]	Group
Assets[b]	116,845	292,850	160,638	74,282	644,615
Risk-weighted assets	42,957	204,913	48,355	24,871	321,096
% of RWA	**Consumer Banking/ Wealth Management**	**Institutional Banking**	**Treasury Markets**	**Others[a]**	**Group**
Credit risk	79%	94%	46%	79%	84%
Market risk	0%	0%	50%	13%	9%
Operational risk	21%	6%	4%	8%	7%

(a) Encompasses assets/ RWA from capital and balance sheet management, funding and liquidity activities, DBS Vickers Group and The Islamic Bank of Asia Limited
(b) Before goodwill and intangibles

3 Risk governance

The Board oversees DBS' affairs and provides sound leadership for the CEO and management. Authorised by the Board, various Board committees oversee specific responsibilities based on clearly defined terms of reference.

Under our risk management approach, the Board, through the Board Risk Management Committee (BRMC), sets our Risk Appetite, oversees the establishment of enterprise-wide risk management policies and processes, and establishes risk appetite limits to guide DBS' risk-taking.



Note: The lines reflect possible escalation protocols and are not reporting lines per se

The BRMC also oversees the identification, monitoring, management and reporting of credit, market, liquidity, operational and reputational risks. To facilitate the BRMC's risk oversight, the following risk management committees have been established.

Risk management committees	
Risk Executive Committee (Risk EXCO)	As the overall executive body regarding risk matters, the Risk EXCO oversees DBS' risk management.
Group Credit Risk Committee (GCRC) Group Credit Policy Committee (GCPC) Group Credit Risk Models Committee (GCRMC) Group Market and Liquidity Risk Committee (GMLRC) Group Operational Risk Committee (GORC) Group Scenario and Stress Testing Committee (GSSTC)	Each of the committees reports to the Risk EXCO, and serves as an executive forum to discuss and implement DBS' risk management. Key responsibilities: • Assess and approve risk-taking activities • Oversee DBS' risk management infrastructure, which includes frameworks, decision criteria, authorities, people, policies, standards, processes, information and systems • Approve risk policies such as model governance standards, stress testing scenarios, and the evaluation and endorsement of risk models • Assess and monitor specific credit concentration • Recommend stress-testing scenarios (including macroeconomic variable projections) and review the results The members in these committees comprise representatives from the Risk Management Group (RMG) as well as key business and support units.
Product Approval Committee (PAC)	The PAC provides group-wide oversight and direction for the approval of new product and outsourcing initiatives. It evaluates new product and outsourcing initiatives to ensure that they are in line with the Group's strategy and risk appetite.

Most of the above committees are supported by local risk committees in all major locations, where appropriate. These local risk committees oversee the local risk positions for all businesses and support units, ensuring that they keep within limits set by the Group risk committees. They also approve location-specific risk policies.

The Chief Risk Officer (CRO), who is a member of the Group Executive Committee and reports to the Chairman of the BRMC and the CEO, oversees the risk management function. The CRO is independent of business lines and is actively involved in key decision-making processes. He often engages with regulators to discuss risk matters, enabling a more holistic risk management perspective.

Working closely with the risk and business committees, the CRO is responsible for the following:

- Management of DBS' risks, including systems and processes to identify, approve, measure, monitor, control and report risks
- Engagement with senior management about material matters regarding all risk types
- Development of risk controls and mitigation processes
- Ensuring DBS' risk management is effective, and the Risk Appetite established by the Board is adhered to

4 Risk Appetite

DBS' Risk Appetite is set by the Board and governed by the Risk Appetite Policy, which articulates the risks that we are willing to accept. It also serves to reinforce our risk culture by setting a clear message from the 'tone from the top'. A strong organisational risk culture, complemented with a balanced incentive framework (refer to "Remuneration Report" section on page 61), helps to further embed our Risk Appetite.

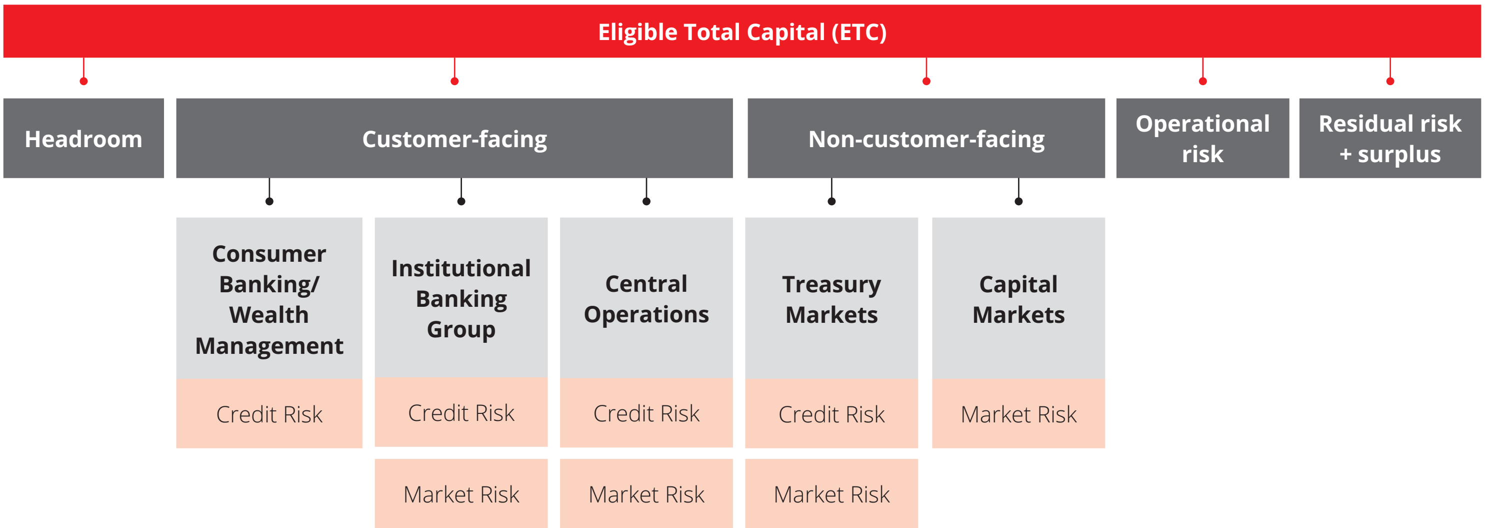
4.1 Risk thresholds and economic capital usage

Our Risk Appetite takes into account a spectrum of risk types and is implemented using thresholds, policies, processes and controls.

Threshold structures are essential in making DBS' Risk Appetite an intrinsic part of our businesses because they help to keep all our risks within acceptable levels. Portfolio risk limits for the quantifiable risk types reach all parts of DBS from the top down, and these are implemented using formal frameworks. As for the non-quantifiable risk types, these are controlled using qualitative principles.

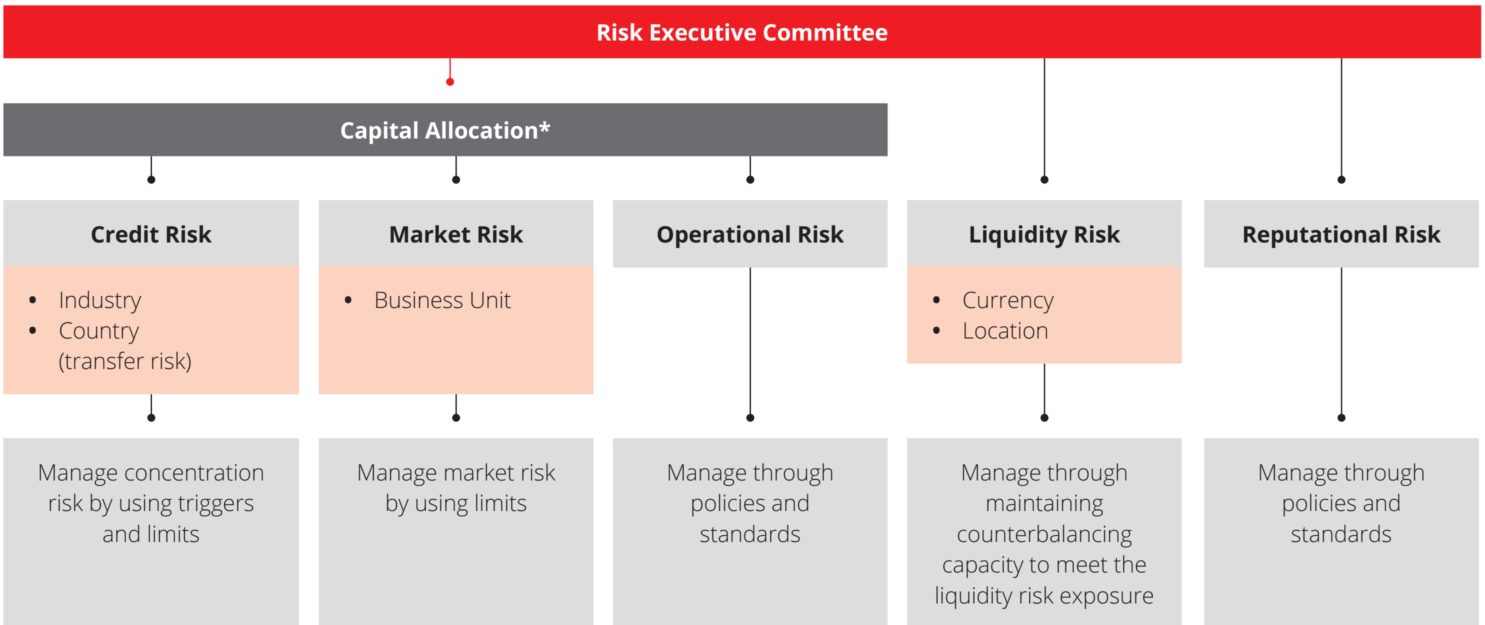
To ensure that the thresholds pertaining to our Risk Appetite are completely risk sensitive, we have adopted economic capital (EC) as our primary risk metric. EC is assessed on top of regulatory capital as part of our Internal Capital Adequacy Assessment Process (ICAAP).

Risk Appetite is managed through a capital allocation structure to monitor internal capital demand. The diagram below shows how risk is managed along the dimensions of customer-facing and non-customer-facing units.



As a commercial bank, DBS allocates more EC to our customer-facing units, as compared to non-customer-facing units. A buffer is also maintained for other risks, such as country, reputational, model risks, etc.

The following chart provides a broad overview of how our Risk Appetite permeates throughout DBS. Refer to Sections 5 through 9 for more information about each risk type.



* *Refer to Capital allocation diagram above*

4.2 Stress testing

Stress testing is an integral part of our risk management process. It includes both sensitivity analysis and scenario analysis, and is conducted regularly. In particular, the ICAAP (a group-wide exercise spanning risk types) is performed annually. In addition, stress tests are carried out in response to microeconomic and macroeconomic conditions, or portfolio developments. Every stress test is documented and the results are discussed at the BRMC.

Stress testing alerts senior management to our potential vulnerability to exceptional but plausible adverse events. As such, stress testing enables us to assess capital adequacy and identify potentially risky portfolio segments as well as inherent systematic risks. This then allows us to develop the right contingency plans, exit strategies and mitigating actions beforehand.

The ICAAP ensures our business plans are consistent with our Risk Appetite. This is done by comparing the projected demand for capital to the projected supply of capital under various scenarios, including severe macroeconomic stress.

5 Credit risk

The most significant measurable risk DBS faces - credit risk - arises from our daily activities in our various businesses. These activities include lending to retail, corporate and institutional customers. It includes the risk of lending, pre-settlement and settlement risk of foreign exchange, derivatives and debt securities.

Refer to Note 42.1 to the financial statements on page 169 for details on DBS' maximum exposure to credit risk.

5.1 Credit risk management at DBS

DBS' approach to credit risk management comprises the following building blocks:

Policies
Risk methodologies
Processes, systems and reports

Policies

The dimensions of credit risk and the scope of its application are defined in the Group Credit Risk Management Policy. Senior management sets the overall direction and policy for managing credit risk at the enterprise level.

The Group Core Credit Risk Policies (CCRPs) established for Consumer Banking/ Wealth Management and Institutional Banking set forth the principles by which DBS conducts its credit risk management and control activities. These policies, supplemented by a number of operational standards and guidelines, ensure consistency in identifying, assessing, underwriting, measuring, reporting and controlling credit risk across DBS, and provide guidance in the formulation of business-specific and/ or location-specific credit risk policies and standards.

The operational standards and guidelines are established to provide greater details on the implementation of the credit principles within the Group CCRPs and are adapted to reflect different credit environments and portfolio risk profiles. The CCRPs are approved by the GCPC.

Risk methodologies

Credit risk is managed by thoroughly understanding our corporate customers - the businesses they are in, as well as the economies in which they operate. It is also managed through statistical models and data analytics for retail customers.

The assignment of credit risk ratings and setting of lending limits are integral parts of DBS' credit risk management process, and we use an array of rating models for our corporate and retail portfolios. Most of these models are built internally using DBS' loss data, and the limits are driven by DBS' Risk Appetite Statement and the Target Market and Risk Acceptance Criteria (TMRAC).

Wholesale borrowers are assessed individually using both judgmental and statistical credit risk models.

They are further reviewed and evaluated by experienced credit risk managers who consider relevant credit risk factors in the final determination of the borrower's risk. For some portfolios within the SME segment, DBS also uses a programme-based approach to achieve a balanced management of risks and rewards. Retail exposures are assessed using credit score models, credit bureau records as well as internally and externally available customer behaviour records supplemented by our Risk Acceptance Criteria (RAC). Credit applications are proposed by the business units, and applications outside the RAC are independently assessed by the credit risk managers.

Refer to Section 5.3 on page 83 to read more about our internal credit risk models.

Pre-settlement credit risk for traded products arising from a counterparty potentially defaulting on its obligations is quantified by evaluation of the market price plus potential future exposure. This is used to calculate DBS' regulatory capital under the Current Exposure Method (CEM), and is included within DBS' overall credit limits to counterparties for internal risk management.

We actively monitor and manage our exposure to counterparties for over-the-counter (OTC) derivative trades to protect our balance sheet in the event of a counterparty default. Counterparty risk exposures that may be adversely affected by market risk events are identified, reviewed and acted upon by management, and highlighted to the appropriate risk committees. Specific wrong-way risk arises when the credit exposure of a counterparty (from the traded product transaction) directly correlates with the probability of default of the counterparty. DBS has a policy to guide the handling of specific wrong-way risk transactions, and its risk measurement metric takes into account the higher risks associated with such transactions.

Issuer default risk that may also arise from derivatives, notes and securities are generally measured based on jump-to-default computations.

Concentration risk management

Our risk management processes, which are aligned with our Risk Appetite, ensure that an acceptable level of risk diversification is maintained across DBS.

For credit risk concentration, we use EC as our measurement tool as it combines the individual risk factors such as the probability of default (PD), loss given default (LGD) and exposure at default (EAD), in addition to industry correlation and portfolio concentration. EC thresholds are set to ensure that the allocated EC stays within our Risk Appetite. Governance processes are in place to ensure that these thresholds are monitored regularly, and appropriate actions are taken when the thresholds are breached.

DBS continually examines and reviews how we can enhance the scope of our thresholds and approaches to manage concentration risk.

Environmental, social and governance risk

Responsible financing, covering environmental, social and governance (ESG) issues, is a topic of increasing importance to societal constituents, and one that affects investing and lending decisions across the bank. DBS recognises that our financing practices have a substantial impact on society and failure of our customers to appropriately manage ESG issues can directly impact their operations and long-term economic viability, and the communities and environment in which they operate.

The Board approves DBS' overall and specific risk governance frameworks and oversees an independent Group-wide risk management system, including responsible financing. DBS had established a Group Responsible Financing Standard that documents our overarching approach to responsible financing and additional assessment required when entering into transactions with elevated ESG risks. The requirements of this Standard represent the minimum standards for DBS and we have also sought alignment, where possible, with international standards and best practices. Where significant ESG issues are identified, escalation is required to the relevant industry specialist and IBG Sustainability Office for further guidance before submitting the credit memorandum to the credit approving authority.

Refer more about "Responsible financing" in the Sustainability Report.

Country risk

Country risk refers to the risk of loss due to events in a specific country (or a group of countries). This includes political, exchange rate, economic, sovereign and transfer risks.

DBS manages country risk through the requirements of the Group CCRP and the said risk is part of our concentration risk management. The way we manage transfer risk at DBS is set out in our Country Risk Management Standard. This includes an internal transfer risk and sovereign risk rating system, where assessments are made independently of business decisions. Our transfer risk limits are set in accordance with the Group Risk Appetite Policy.

Transfer risk limits for priority countries are set based on country-specific strategic business considerations as well as the acceptable potential loss according to our Risk Appetite. Management actively evaluates and determines the appropriate level of transfer risk exposures for these countries taking into account the risks and rewards and whether they are in line with our strategic intent. Limits for all other non-priority countries are set using a model-based approach.

All transfer risk limits are approved by the BRMC.

Credit stress testing

DBS engages in various types of credit stress testing, and these are driven either by regulators or internal requirements and management.

Our credit stress tests are performed at the total portfolio or sub-portfolio level, and are generally conducted to assess the impact of changing economic conditions on asset quality, earnings performance, capital adequacy and liquidity. DBS' stress testing programme is comprehensive and covers all major functions and areas of business.

DBS typically performs the following types of credit stress testing at a minimum and others as necessary:

Pillar 1 credit stress testing	DBS conducts Pillar 1 credit stress testing regularly as required by regulators. Under Pillar 1 credit stress testing, DBS assesses the impact of a mild stress scenario (at least two consecutive quarters of zero GDP growth) on Internal Ratings-Based (IRB) estimates (i.e. PD, LGD and EAD) and the impact on regulatory capital. The purpose of the Pillar 1 credit stress test is to assess the robustness of internal credit risk models and the cushion above minimum regulatory capital.
Pillar 2 credit stress testing	DBS conducts Pillar 2 credit stress testing once a year as part of the ICAAP. Under Pillar 2 credit stress testing, DBS assesses the impact of stress scenarios, with different levels of severity, on asset quality, earnings performance as well as internal and regulatory capital. The results of the credit stress test form inputs to the capital planning process under ICAAP. The purpose of the Pillar 2 credit stress testing is to examine, in a rigorous and forward-looking manner, the possible events or changes in market conditions that could adversely impact DBS and to develop the appropriate action plan.
Industry-wide stress testing	DBS participates in the annual industry-wide stress test (IWST) conducted by the Monetary Authority of Singapore (MAS) to facilitate the ongoing assessment of Singapore's financial stability. Under the IWST, DBS is required to assess the impact of adverse scenarios, as defined by the regulator, on asset quality, earnings performance and capital adequacy.
Sensitivity and scenario analyses	DBS also conducts multiple independent sensitivity analyses and credit portfolio reviews based on various scenarios. The intent of these analyses and reviews is to identify vulnerabilities for the purpose of developing and executing mitigating actions.

Processes, systems and reports

DBS constantly invests in systems to support risk monitoring and reporting for our Institutional Banking and Consumer Banking/ Wealth Management businesses.

The end-to-end credit process is continually being reviewed and improved through various front-to-back initiatives involving business, operations, risk management and other key stakeholders. Day-to-day monitoring of credit exposures, portfolio performance and external environmental factors potentially affecting credit risk profiles is key to our philosophy of effective credit risk management.

In addition, credit trends, which may include industry analysis, early warning alerts and significant weak credits, are submitted to the various risk committees, allowing key strategies and action plans to be formulated and evaluated. Credit control functions also ensure that any credit risk taken complies with the credit risk policies and standards. These functions ensure that approved limits are activated, credit excesses and policy exceptions are appropriately endorsed, compliance with credit standards is carried out, and covenants established are monitored.

Independent risk management functions that report to the CRO are jointly responsible for developing and maintaining a robust credit stress testing programme. These units oversee the implementation of credit stress tests as well as the analysis of the results, of which management, various risk committees and regulators are informed.

Non-performing assets

DBS' credit facilities are classified as "Performing assets" or "Non-performing assets" (NPA), in accordance with the MAS Notice to Banks No. 612 "Credit Files, Grading and Provisioning" (MAS Notice 612).

Credit exposures are categorised into one of the following five categories, according to our assessment of a borrower's ability to repay a credit facility from its normal sources of income and/ or the repayment behaviour of the borrower.

Classification grade	Description
Performing assets	
Pass	Indicates that the timely repayment of the outstanding credit facilities is not in doubt.
Special mention	Indicates that the borrower exhibits potential weaknesses that, if not corrected in a timely manner, may adversely affect future repayments and warrant close attention by DBS.
Classified or NPA	
Substandard	Indicates that the borrower exhibits definable weaknesses in its business, cash flow or financial position that may jeopardise repayment on existing terms.
Doubtful	Indicates that the borrower exhibits severe weaknesses such that the prospect of full recovery of the outstanding credit facilities is questionable and the prospect of a loss is high, but the exact amount remains undeterminable as yet.
Loss	Indicates that the outstanding credit facility is not collectable, and little or nothing can be done to recover the outstanding amount from any collateral or from the assets of the borrower generally.

A default is considered to have occurred with regard to a particular borrower when either or both of the following events have taken place:

- Subjective default: Borrower is considered to be unlikely to pay its credit obligations in full, without DBS taking action such as realising security (if held)
- Technical default: Borrower is more than 90 days past due on any credit obligation to DBS

For retail borrowers, the categorisation into the respective MAS loan grades is at the facility level and consistent with MAS Notice 612.

Credit facilities are classified as restructured assets when we grant non-commercial concessions to a borrower because its financial position has deteriorated or is unable to meet the original repayment schedule. A restructured credit facility is classified into the appropriate non-performing grade based on the assessment of the borrower's financial condition and its ability to repay according to the restructured terms.

Such credit facilities are not returned to the performing status until there are reasonable grounds to conclude that the borrower will be able to service all future principal and interest payments on the credit facility in accordance with the restructured terms and MAS Notice 612. Apart from what has been described, we do not grant concessions to borrowers in the normal course of business.

In addition, it is not within DBS' business model to acquire debts that have been restructured at inception (e.g. distressed debts).

Refer to Note 2.11 to the financial statements on page 125 for our accounting policies regarding specific and general allowances for credit losses.

In general, specific allowances are recognised for defaulting credit exposures rated substandard and below.

The breakdown of our NPA by loan grading and industry and the related amounts of specific allowances can be found in Note 42.2 to the financial statements on page 171. A breakdown of past due loans can also be found in the same note.

When required, we will take possession of all collateral and dispose them as soon as practicable. Realised proceeds are used to reduce outstanding indebtedness.

A breakdown of collateral held for NPA is shown in Note 42.2 to the financial statements on page 174.

Repossessed collateral is classified in the balance sheet as other assets. The amounts of such other assets for 2019 and 2020 were not material.

5.2 Credit risk mitigants

Collateral received

Where possible, DBS takes collateral as a secondary source of repayment. This includes, but is not limited to, cash, marketable securities, real estate, trade receivables, inventory, equipment, and other physical and/ or financial collateral. We may also take fixed and floating charges on the assets of borrowers.

Policies are in place to determine the eligibility of collateral for credit risk mitigation. Collateral is generally diversified and periodic valuations of collateral are required. Real estate constitutes the bulk of our collateral, while marketable securities and cash are immaterial.

For derivatives, repurchase agreements (repo) and other repo-style transactions with financial market counterparties, collateral arrangements are typically covered under market-standard documentation, such as International Swaps & Derivatives Association (ISDA) Agreements and Master Repurchase Agreements. The collateral received is marked-to-market on a frequency that DBS and the counterparties have mutually agreed upon. This is governed by internal guidelines with respect to collateral eligibility. In the event of a default, the credit risk exposure is reduced by master-netting arrangements where DBS is allowed to offset what we owe a counterparty against what is due from that counterparty in a netting-eligible jurisdiction.

Refer to Note 14 to the financial statements on page 137 for further information on financial assets and liabilities subject to netting agreement but not offset on the balance sheet.

Collateral held against derivatives generally consists of cash in major currencies and highly rated government or quasi-government bonds. Exceptions may arise in certain countries, where due to domestic capital markets and business conditions, the bank may be required to accept less highly rated or liquid government bonds and currencies. Reverse repo-transactions are generally traded with large institutions with reasonably good credit standing. DBS takes haircuts against the underlying collateral of these transactions that commensurate with collateral quality to ensure credit risks are adequately mitigated.

In times of difficulty, we will review the customers' specific situation and circumstances to assist them in restructuring their financial obligations.

However, should the need arise, disposal and recovery processes are in place to dispose the collateral held. DBS maintains a panel of agents and solicitors to assist in the disposal of non-liquid assets and specialised equipment quickly.

Collateral posted

DBS is required to post additional collateral in the event of a rating downgrade. As at 31 December 2020, for a three-notch downgrade of its Standard & Poor's Ratings Services and Moody's Investors Services ratings, DBS will have to post additional collateral amounting to SGD 11 million (2019: SGD 11 million).

For additional collateral amount in the event of a rating downgrade, Lakshmi Vilas Bank is excluded as the impact is estimated to be insignificant.

Other credit risk mitigants

DBS accepts guarantees as credit risk mitigants. Internal requirements for considering the eligibility of guarantors for credit risk mitigation are in place.

5.3 Internal credit risk models

DBS adopts rating systems for the different asset classes under the Internal Ratings - Based Approach (IRBA).

There is a robust governance process for the development, independent validation and approval of any credit risk model. The models go through a rigorous review process before they are endorsed by the GCRMC and Risk EXCO. They must also be approved by the BRMC before submission for regulatory approval. The key risk measures generated by the internal credit risk rating models to quantify regulatory capital include PD, LGD and EAD. For portfolios under the Foundation IRBA, internal estimates of PD are used while the supervisory LGD and EAD estimates are applied. For retail portfolios under the Advanced IRBA, internal estimates of PD, LGD and EAD are used. In addition, the ratings from the credit models act as the basis for underwriting credit risk, monitoring portfolio performance and determining business strategies. The performance of the rating systems is monitored regularly and reported to the GCRMC, Risk EXCO and BRMC to ensure their ongoing effectiveness.

An independent risk unit conducts formal validations for the respective rating systems annually. The validation processes are also independently reviewed by Group Audit. These serve to highlight material deterioration in the rating systems for management attention.

5.3.1 Retail exposure models

Retail portfolios are categorised into the following asset classes under the Advanced IRBA: residential mortgages, qualifying revolving retail exposures and other retail exposures.

Within each asset class, exposures are managed on a portfolio basis. Each customer or account is assigned to a risk pool, considering factors such as borrower characteristics and collateral type. PD, EAD and LGD estimates are based on internal historical default, utilisation and realised losses within a defined period. Default is identified at the facility level.

Product-specific credit risk elements such as underwriting criteria, scoring models, approving authorities and asset quality and business strategy reviews, as well as systems, processes and techniques to monitor portfolio performance, are in place. Credit risk models for secured and unsecured portfolios are also used to update the risk level of each loan on a monthly basis, reflecting the broad usage of risk models in portfolio quality reviews.

5.3.2 Wholesale exposure models

Wholesale exposures are under the Foundation IRBA for capital computation. They include sovereign, bank and corporate. Specialised lending exposures are under IRBA using supervisory slotting criteria.

Sovereign exposures are risk-rated using internal risk-rating models. Factors related to country-specific macroeconomic risk, political risk, social risk and liquidity risk are included in the sovereign rating models to assess the sovereign credit risk in an objective and systematic manner.

Bank exposures are assessed using the bank-rating model. The model considers both quantitative and qualitative factors such as capital levels and liquidity, asset quality, earnings, management and market sensitivity.

Large corporate exposures are assessed using internal rating models. Factors considered in the risk assessment process include the counterparty's financial strength and qualitative factors such as industry risk, access to funding, market standing and management strength.

SME credit rating models consider risk factors such as those relating to the counterparty's financial strength, qualitative factors, as well as account performance.

Credit risk ratings under the IRBA portfolios are, at a minimum, reviewed by designated approvers on an annual basis unless credit conditions require more frequent assessment.

5.3.3 Specialised lending exposures

Specialised lending IRBA portfolios include income-producing real estate, project finance, object finance, and commodities finance. These adopt the supervisory slotting criteria specified under Annex 7v of MAS Notice 637, which are used to determine the risk weights to calculate credit risk-weighted exposures.

5.3.4 Securitisation exposures

We arrange securitisation transactions for our clients for fees. These transactions do not involve special-purpose entities that we control. For transactions that are not underwritten, no securitisation exposures are assumed as a direct consequence of arranging the transactions. Any decision to invest in any of such arranged transactions is subject to independent risk assessment.

Where DBS provides an underwriting commitment, any securitisation exposure that arises will be held in the trading book to be traded or sold down in accordance with our internal policy and risk limits. In addition, DBS does not provide implicit support for any transactions we structure or have invested in.

We invest in our clients' securitisation transactions from time to time. These may include securitisation transactions arranged by us or with other parties.

We may also act as a liquidity facility provider, working capital facility provider or swap counterparty. Such exposures require the approval of the independent risk function and are subject to regular risk reviews. We also have processes in place to monitor the credit risk of our securitisation exposures.

5.3.5 Credit exposures falling outside internal credit risk models

DBS applies the Standardised Approach (SA) for portfolios that are expected to transit to IRBA or for portfolios that are immaterial in terms of size and risk profile. These portfolios include:

- IRBA-transitioning retail and wholesale exposures
- IRBA-exempt retail exposures
- IRBA-exempt wholesale exposures

Any identified transitioning retail and/ or wholesale exposures are expected to adopt Advanced or Foundation IRBA, subject to approval by regulators. Prior to regulatory approval, these portfolios are under SA.

The portfolios under the SA are subject to our overall governance framework and credit risk management practices. DBS continues to monitor the size and risk profile of these portfolios and will enhance the relevant risk measurement processes if these risk exposures become material.

DBS uses external ratings for credit exposures under the SA where relevant, and we only accept ratings from Standard & Poor's, Moody's and Fitch in such cases. DBS follows the process prescribed in MAS Notice 637 to map the ratings to the relevant risk weights.

5.4 Credit risk in 2020

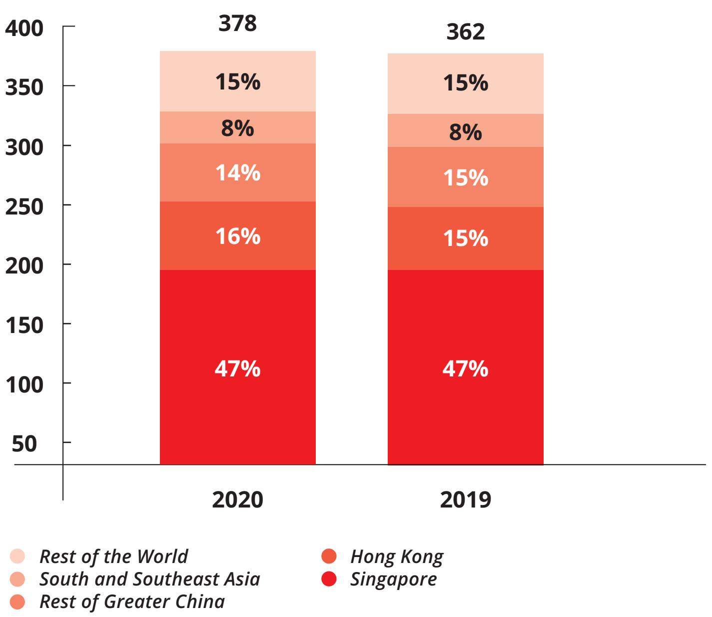
Concentration risk

DBS' geographic distribution of customer loans remains stable.

Singapore, our home market, continues to account for the largest share of our gross loans and advances to customers which contributed to 47% of our total portfolio. Growth was seen mainly in Singapore, Hong Kong and Rest of the World.

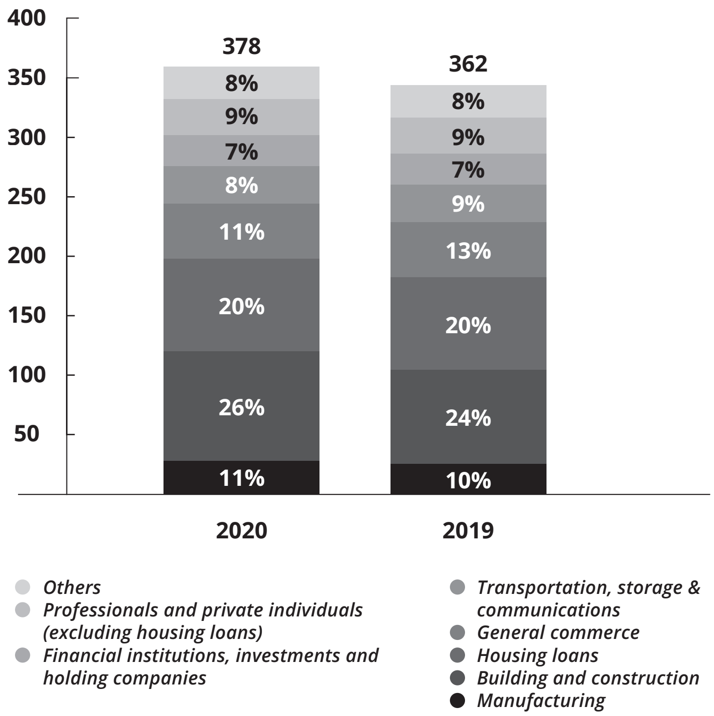
Our portfolio is well diversified across industry and business segments. Building and construction, general commerce and manufacturing remain the largest contributors in the wholesale portfolio, accounting for 48% of the total portfolio.

Geographical Concentration (SGD billion)



Above refers to gross loans and advances to customers based on country of incorporation

Industry Concentration (SGD billion)



Above refers to gross loans and advances to customers based on MAS Industry Code

Refer to Note 42.4 to the financial statements on page 175 for DBS' breakdown of credit risk concentration.

Non-performing assets

New non-performing asset (NPA) formation was partially moderated by recoveries and write-offs. In absolute terms, our total NPA, including the addition from the consolidation of Lakshmi Vilas Bank, increased by 16% from the previous year to SGD 6.69 billion and non-performing loans (NPL) ratio was at 1.6% in 2020.

Refer to "CFO Statement" on page 20.

Collateral received

The tables below provide breakdowns by loan-to-value (LTV) bands for the borrowings secured by real estate and other collateral from the various market segments.

Residential mortgage loans

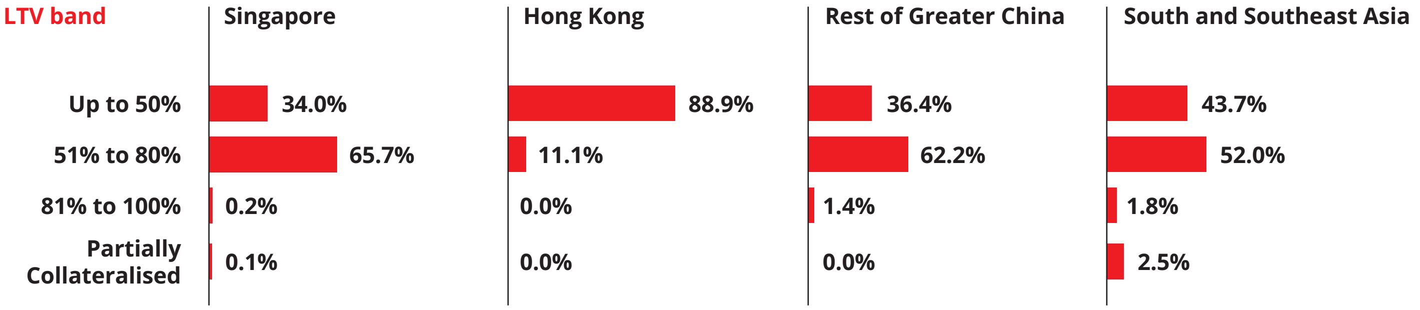
The LTV ratio is calculated using mortgage loans including undrawn commitments divided by the collateral value. Property valuations are determined using a combination of professional appraisals and housing price indices.

For Singapore mortgages, new loans are capped at LTV limits of up to 75% for private residential mortgages, since July 2018. In tandem with the macro-prudential measures, private property price increases have moderated at about 2.2% year-on-year, there was an approximate 1.9% shift in the proportion of mortgage exposure from the LTV > 50% to the up-to-50% LTV band.

For Hong Kong mortgages, there was an approximate 2.2% increase in the proportion of mortgage exposure in the 51% to 80% LTV band due to higher proportion of matured/closed mortgage accounts in the up to 50% LTV band. Hong Kong property price index increased slightly by 1.3% in 2020.

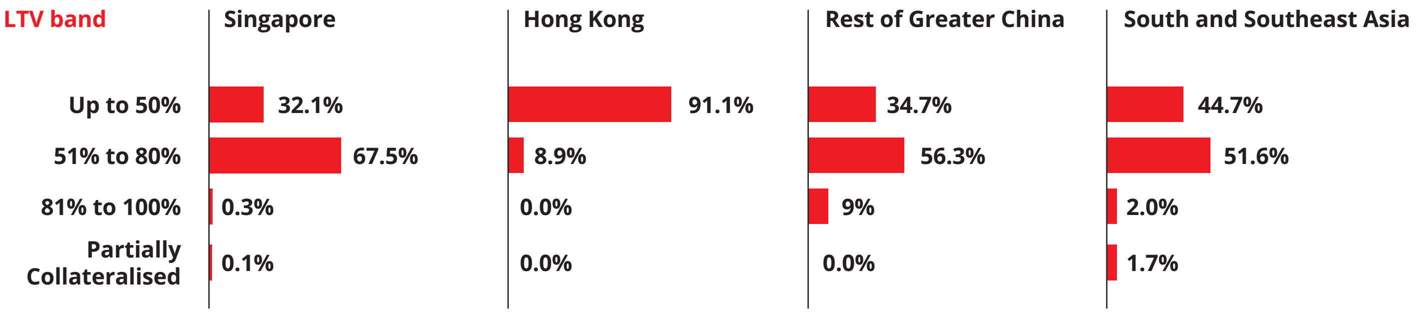
Percentage of residential mortgage loans (breakdown by LTV band and geography)

As at 31 December 2020



This excludes the loans and collateral of Lakshmi Vilas Bank that was amalgamated with DBS India Ltd on 27 Nov 2020.

As at 31 December 2019



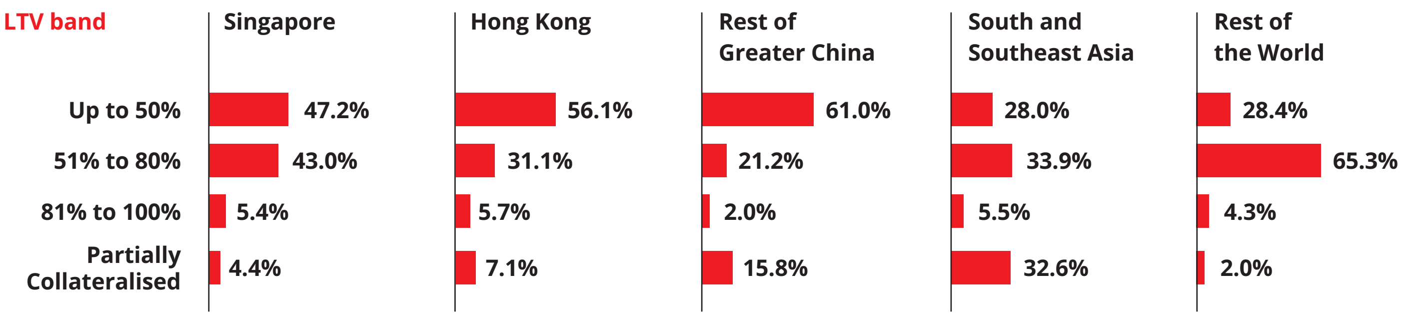
Loans and advances to corporates secured by real estate

These secured loans are extended for the purpose of acquisition and/ or development of real estate, as well as for general working capital. More than 90% of such loans are fully collateralised and majority of these loans have LTV < 80%. Our property loans are mainly concentrated in Singapore and Hong Kong, which together accounted for 82% of the total property loans.

The LTV ratio is calculated as loans and advances divided by the value of collaterals that secure the same facility. Real estate forms a substantial portion of the collaterals; other collaterals such as cash, marketable securities, and bank guarantees are also included.

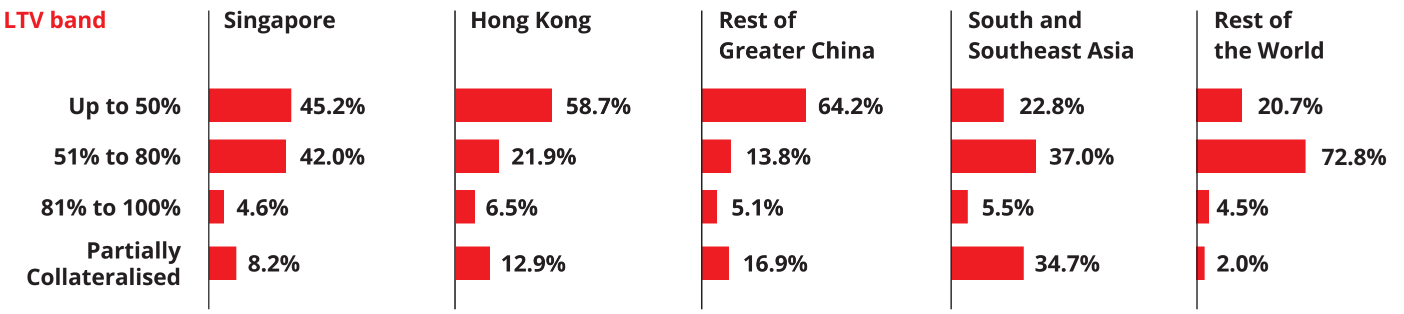
Percentage of loans and advances to corporates secured by real estate (breakdown by LTV band and geography)

As at 31 December 2020



This excludes the loans and collateral of Lakshmi Vilas Bank that was amalgamated with DBS India Ltd on 27 Nov 2020.

As at 31 December 2019



Loans and advances to banks
In line with market convention, loans and advances to banks are typically unsecured. DBS manages the risk of such exposures by keeping tight control of the exposure tenor and monitoring of their credit quality.

Derivatives counterparty credit risk by markets and settlement methods
We continue to manage our derivatives counterparty risk exposures with netting and collateral arrangements, thereby protecting our balance sheet in the event of a counterparty default.

A breakdown of our derivatives counterparty credit risk by markets (OTC versus exchange- traded) and settlement methods (cleared through a central counterparty versus settled bilaterally) can be found below.

Notional OTC and exchange-traded products

In notional terms, SGD million	As at 31 Dec 2020
OTC derivatives cleared through a central counterparty	985,222
OTC derivatives settled bilaterally	1,115,076
Total OTC derivatives	**2,100,298**
Exchange-traded dervatives	8,406
Total derivative	**2,108,704**

Please refer to Note 37 to the financial statements on page 159 for a breakdown of the derivatives positions held by DBS.

6 Market risk

Our exposure to market risk is categorised into:

Trading portfolios: Arising from positions taken for (i) market-making, (ii) client facilitation and (iii) benefiting from market opportunities.

Non-trading portfolios: Arising from (i) positions taken to manage the interest rate risk of our Institutional Banking and Consumer Banking assets and liabilities, (ii) debt securities and equities comprising investments held for yield and/ or long-term capital gains, (iii) strategic stakes in entities and (iv) structural foreign exchange risk arising mainly from our strategic investments, which are denominated in currencies other than the Singapore Dollar.

We use a variety of financial derivatives such as swaps, forwards and futures, and options for trading and hedging against market movements.

6.1 Market risk management at DBS

DBS' approach to market risk management comprises the following building blocks:

Policies
Risk methodologies
Processes, systems and reports

Policies
The Group Market Risk Management Policy sets our overall approach towards market risk management. This policy is supplemented with standards and guides, which facilitate the identification, measurement, control, monitoring and reporting of market risk in a consistent manner. They also set out the overall approach, requirements and controls governing market risk stress testing across DBS.

The criteria for determining the positions to be included in the trading book are stipulated in the Trading Book Policy Statement.

Risk methodologies
DBS utilises Value-at-Risk (VaR), a statistical risk measure, to estimate the potential loss from market movements. This measure uses historical simulation based on data for the previous 12 months. It assumes that historical changes in market values reflect the distribution of potential outcomes in the immediate future.

DBS limits and monitors market risk exposures using Expected Shortfall (ES) that is VaR calculated with a one-day holding period and an expected tail-loss methodology which approximates a 97.5% confidence interval.

The market risk economic capital that is allocated by the BRMC is linked to ES by a multiplier. ES is supplemented with risk control metrics such as sensitivities to risk factors and loss triggers for management action.

DBS conducts backtesting to verify the predictiveness of the VaR model. Backtesting compares VaR calculated for positions at the close of each business day with the profit and loss (P&L) that arises from those positions on the following business day. The backtesting P&L excludes fees and commissions, revenues from intra-day trading, non-daily valuation adjustments and time effects.

For backtesting, VaR at the 99% confidence interval and over a one-day holding period is used. We adopt the standardised approach to compute market risk regulatory capital under MAS Notice 637 for the trading book positions. As such, VaR backtesting does not impact our regulatory capital for market risk.

There are limitations to VaR models; for example, past changes in market risk factors may not provide accurate predictions of future market movements, and the risk arising from adverse market events may be understated.

To monitor DBS' vulnerability to unexpected but plausible extreme market risk-related events, we conduct multiple market risk stress tests regularly. These cover trading and non-trading portfolios and follow a combination of historical and hypothetical scenarios depicting risk-factor movement.

ES and Net Interest Income (NII) variability are the key risk metrics used to manage our assets and liabilities. Credit risk arising from loans and receivables is managed under the credit risk management framework. Interest rate risk in the banking book (IRRBB) arises from mismatches in the interest rate profiles of assets, liabilities and capital instruments. Estimating IRRBB requires the use of behavioural models and assumptions on certain parameters such as loan prepayment, fixed deposits early redemption and the duration of non-maturity deposits. DBS measures IRRBB on a weekly and monthly basis.

Processes, systems and reports
Robust internal control processes and systems have been designed and implemented to support our market risk management approach. DBS reviews these control processes and systems regularly, and these reviews allow senior management to assess their effectiveness.

The RMG Market and Liquidity Risk unit - an independent market risk management function reporting to the CRO - monitors, controls and analyses DBS' market risk daily. The unit comprises risk control, risk analytics, production and reporting teams.

6.2 Market risk in 2020

The main risk factors driving DBS' trading portfolios in 2020 were interest rates, foreign exchange, equities and credit spreads. The following table shows the period-end, average, high and low diversified ES and ES by risk class for our trading portfolios.

1 Jan 2020 to 31 Dec 2020				
SGD million	**As at 31 Dec 2020**	**Average**	**High**	**Low**
Diversified	19	13	31	8
Interest rates	12	14	27	7
Foreign exchange	7	4	8	1
Equity	6	3	11	#
Credit spread	14	14	18	5
Commodity	#	#	1	#

 # Amount under SGD 500,000

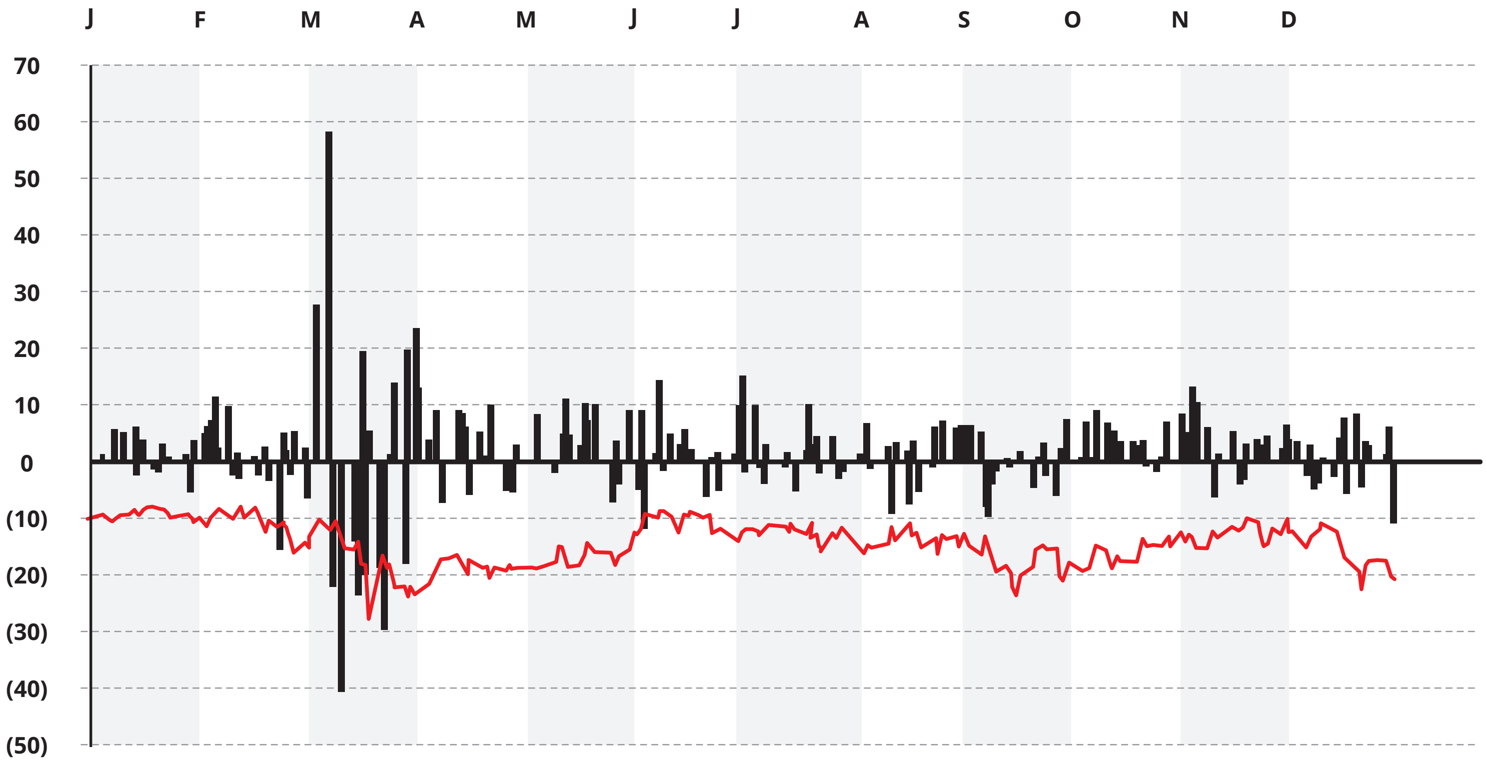
This excludes the positions from Lakshmi Vilas Bank (LVB) that was amalgamated with DBS India Ltd on 27 Nov 2020. Impact to DBS' trading book due to LVB's positions is assessed to be insignificant.

1 Jan 2019 to 31 Dec 2019				
SGD million	**As at 31 Dec 2020**	**Average**	**High**	**Low**
Diversified	10	9	14	6
Interest rates	11	9	16	6
Foreign exchange	4	4	7	2
Equity	1	1	6	#
Credit spread	5	6	9	4
Commodity	#	#	#	#

 # Amount under SGD 500,000

DBS' trading portfolios experienced seven backtesting exceptions in 2020 and they occurred in February, March and June. The backtesting exceptions were largely due to large movements in the US Dollar interest rates, credit spreads and equity volatilities brought about by the Covid-19 pandemic.

SGD million



This excludes the positions from Lakshmi Vilas Bank that was amalgamated with DBS India Ltd on 27 Nov 2020.

● *Backtesting profit and loss (in SGD million)* ● *VaR at 99% confidence interval (in SGD million)*

In 2020, the key market risk drivers of our non-trading portfolios were interest rates (Singapore Dollar and US Dollar) and foreign exchange.

The Net Interest Income (NII) of the non-trading book is assessed under various rate scenarios to determine the impact of interest rate movements on future earnings. Simulating using a 100 basis points parallel upward or downward shift in yield curves on DBS' banking book exposures, NII[(a)] is estimated to increase by SGD 1,221 million and decrease by SGD 1,037 million respectively.

Foreign exchange risk in our non-trading portfolios was primarily from structural foreign exchange positions[(b)], arising mainly from our strategic investments and retained earnings in overseas branches and subsidiaries.

(a) For NII simulation, Lakshmi Vilas Bank is excluded as the impact is estimated to be insignificant.
(b) Refer to Note 38.3 to the financial statements on page 164 for details on DBS' structural foreign exchange positions.

7 Liquidity risk

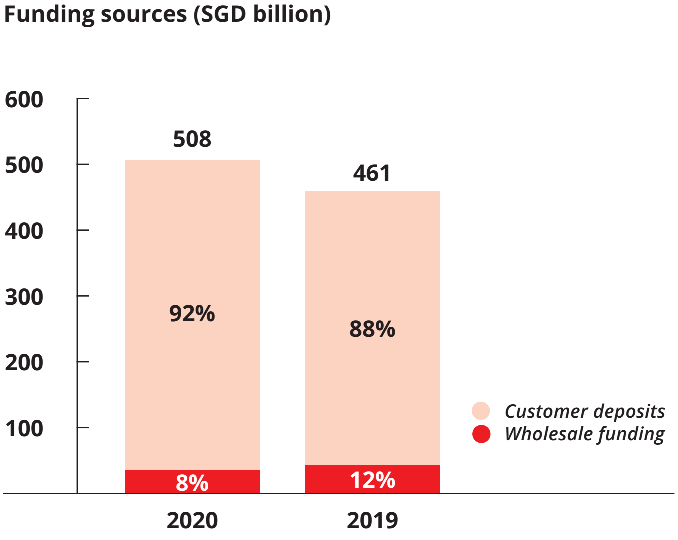
DBS' liquidity risk arises from our obligations to honour withdrawals of deposits, repayments of borrowed funds at maturity and our commitments to extend loans to our customers. We seek to manage our liquidity to ensure that our liquidity obligations will continue to be honoured under normal as well as adverse circumstances.

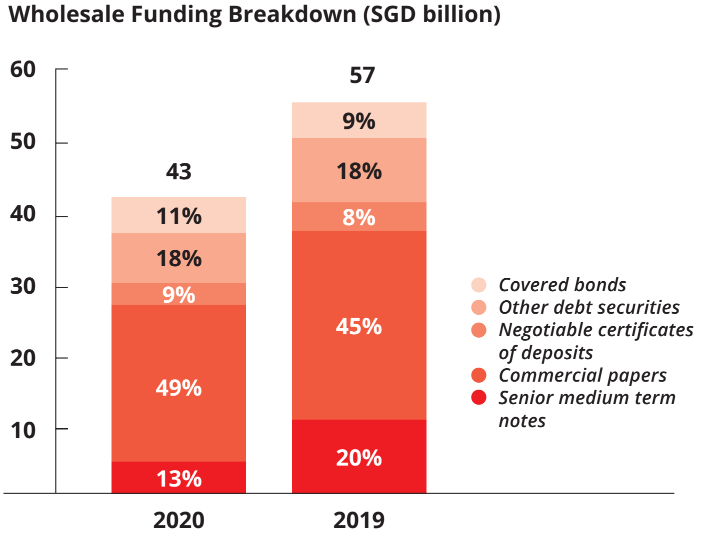
7.1 Liquidity risk management at DBS

Liquidity management and funding strategy

DBS strives to develop a diversified funding base with access to funding sources across retail and wholesale channels. Our funding strategy is anchored on the strength of our core deposit franchise and is augmented by our established long-term funding capabilities.

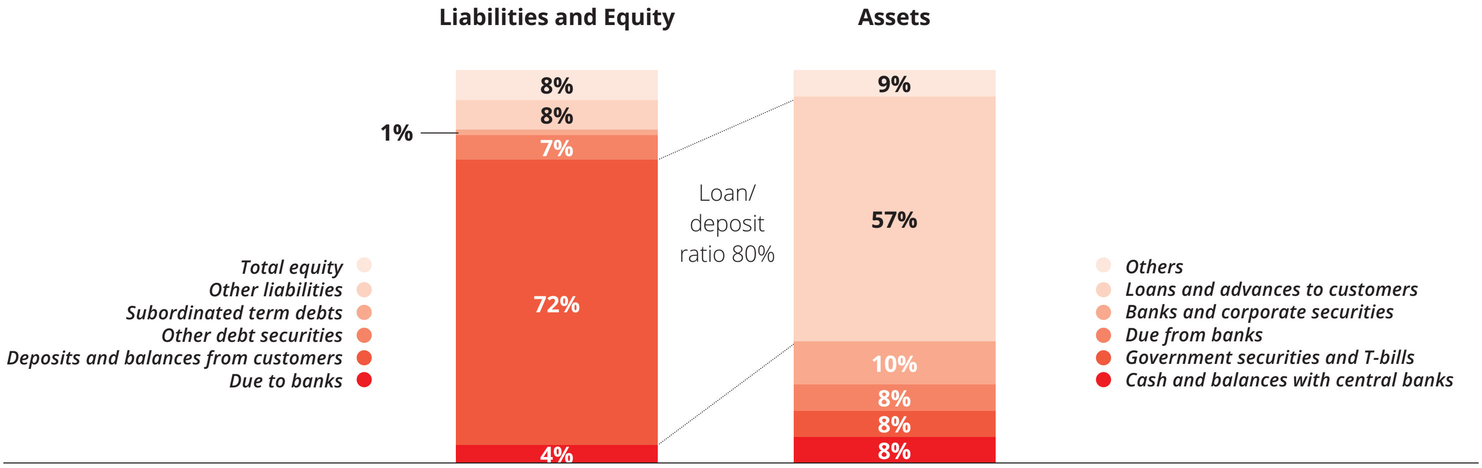
Including Lakshmi Vilas Bank, Current Account Savings Account (CASA) as a proportion of customer deposits increased to 73% as at December 2020 from 59% as at December 2019.





DBS aims to maintain continuous access to the investor base for capital and senior wholesale funding to support our commercial banking activities. We seek cost efficiencies over the long term and to broaden our investor base through proactive and frequent engagement. Capital instruments are primarily issued from DBS Group Holdings Ltd (DBSH) while covered bonds originate from DBS Bank Ltd. Senior notes are issued from both DBSH and the Bank as required.

The diagrams below show our asset funding structure as at 31 December 2020.



Refer to Note 30 to the financial statements on page 150 for more details of our wholesale funding sources and Note 43.1 on page 177 for the contractual maturity profile of our assets and liabilities.

Growth in the regional franchise generates price, volume, currency and tenor mismatches between our assets and liabilities. To this end, where practicable and transferable without loss in value, we make appropriate use of swap markets for relevant currencies, commensurate with the liquidity of each, in the conversion and deployment of surplus funds across locations.

As these swaps typically mature earlier than loans, we are exposed to potential cash flow mismatches arising from the risk that counterparties may not roll over maturing swaps to support our ongoing funding needs. This risk is mitigated by triggers set on the number of swaps transacted with the market and by conservative assumptions on the cash flow behaviour of swaps under our cash flow maturity gap analysis (refer to Section 7.2 on page 90).

In general, the term borrowing needs are managed centrally by the head office and in consultation with our overseas locations, subject to relevant regulatory restrictions and to an appropriate level of presence and participation required by the respective local funding markets.

The Group Asset and Liability Committee and respective Location Asset and Liability Committees regularly review the composition and growth trajectories of the relevant balance sheets and refine our funding strategy according to business momentum, competitive factors and prevailing market conditions.

Approach to liquidity risk management
DBS' approach to liquidity risk management comprises the following building blocks:

- **Policies**
- **Risk methodologies**
- **Processes, systems and reports**

Policies
The Group Liquidity Risk Management Policy sets our overall approach towards liquidity risk management and describes the range of strategies we employ to manage our liquidity.

These strategies include maintaining an adequate counterbalancing capacity to address potential cash flow shortfalls and having diversified sources of liquidity.

DBS' counterbalancing capacity includes liquid assets, the capacity to borrow from the money markets (including the issuance of commercial papers and covered bonds), and forms of managerial interventions that improve liquidity. In the event of a potential or actual crisis, we have in place a set of liquidity contingency and recovery plans to ensure that we maintain adequate liquidity.

The Group Liquidity Risk Management Policy is supported by Standards that establish the detailed requirements for liquidity risk identification, measurement, reporting and control within DBS. The set of Policies, Standards and supporting Guides communicate these baseline requirements to ensure a consistent application throughout DBS.

Risk methodologies
The primary measure used to manage liquidity within the tolerance defined by the Board is cash flow maturity mismatch analysis.

This form of analysis is performed on a regular basis under normal and adverse scenarios. It assesses the adequacy of our counterbalancing capacity to fund or mitigate any cash flow shortfalls that may occur as forecasted in the cash flow movements across successive time bands. To ensure that liquidity is managed in line with our Risk Appetite, core parameters such as the types of scenarios, the survival period and the minimum level of liquid assets, are pre-specified for monitoring and control on a group-wide basis. Any occurrences of forecasted shortfalls that cannot be covered by our counterbalancing capacity will be escalated to the relevant committees for evaluation and action.

Liquidity risk stress testing is performed regularly using cash flow maturity mismatch analysis, and covers adverse scenarios including general market and idiosyncratic stress scenarios. Stress tests assess our vulnerability when liability run-offs increase, asset rollovers increase and/ or liquid asset buffers decrease. In addition, ad hoc stress tests are performed as part of our recovery planning and ICAAP exercises.

Liquidity risk control measures such as liquidity-related ratios and balance sheet analysis are complementary tools for cash flow maturity mismatch analysis, and they are performed regularly to obtain deeper insights and finer control over our liquidity profile across different locations. The liquidity risk control measures also include concentration measures regarding top depositors, wholesale borrowing and swapped funds ratios.

Processes, systems and reports
Robust internal control processes and systems support our overall approach in identifying, measuring, aggregating, controlling and monitoring liquidity risk across DBS. Continuous improvement in data and reporting platforms has allowed most elements of internal liquidity risk reporting to be centralised.

The RMG Market and Liquidity Risk unit manages the day-to-day liquidity risk monitoring, control reporting and analysis.

7.2 Liquidity risk in 2020
DBS actively monitors and manages our liquidity profile through cash flow maturity mismatch analysis.

In forecasting cash flow under the analysis, behavioural profiling is necessary in cases where a product has indeterminate maturity or the contractual maturity does not realistically reflect the expected cash flow.

Two examples are maturity-indeterminate savings and current account deposits, which are generally viewed as sources of stable funding for commercial banks. In fact, they consistently exhibit stability even under historic periods of stress. A conservative view is adopted in the behavioural profiling of assets, liabilities and off-balance sheet commitments that have exhibited cash flow patterns that differ significantly from the contractual maturity profile shown under Note 43.1 of our financial statements on page 177.

The table below shows our behavioural net and cumulative maturity mismatch between assets and liabilities over a one-year period, in a normal scenario without incorporating growth projections. DBS' liquidity was observed to remain adequate in the maturity mismatch analysis. In 2020, the liquidity profile improved as deposit growth replaced shorter term funding while excess liquidity is retained in short term funds.

SGD million[(a)]	Less than 7 days	1 week to 1 month	1 to 3 months	3 to 6 months	6 months to 1 year
As at 31 Dec 2020[(b) (c)] Net liquidity mismatch	26,191	12,542	6,407	9,742	6,158
Cumulative mismatch[(c)]	26,191	38,733	45,140	54,882	61,040
As at 31 Dec 2019[(b)] Net liquidity mismatch	24,645	(1,458)	(11,813)	6,162	12,039
Cumulative mismatch	24,645	23,187	11,374	17,536	29,575

(a) Positive indicates a position of liquidity surplus. Negative indicates a liquidity shortfall that has to be funded
(b) As the behavioural assumptions used to determine the maturity mismatch between assets and liabilities are updated from time to time, the liquidity mismatches may not be directly comparable across past balance sheet dates
(c) This excludes the assets and liabilities of Lakshmi Vilas Bank (LVB) that was amalgamated with DBS India on 27 Nov 2020. Impact from LVB's positions is estimated to be insignificant

7.3 Liquid assets

Liquid assets are assets that are readily available and can be easily monetised to meet obligations and expenses under times of stress.

Such assets are internally defined under the governance of the relevant oversight committees, taking into account the asset class, issuer type and credit rating, among other criteria, before they are reflected as available funds through cash flow maturity mismatch analysis. DBS' Treasury function expects to be able to operationally monetise our pool of liquid assets to meet liquidity shortfalls when the need arises. These liquid assets must be unencumbered and free of any legal, regulatory, contractual or other restrictions.

In practice, liquid assets are maintained in key locations and currencies to ensure that operating entities in such locations possess a degree of self-sufficiency to support business needs and guard against contingencies. The main portion of our liquid assets is centrally maintained in Singapore to support liquidity needs in smaller overseas subsidiaries and branches. Internally, DBS sets a requirement to maintain its pool of liquid assets above a minimum level as a source of contingent funds, taking into account regulatory recommended liquid asset levels as well as internally projected stress shortfalls under the cash flow maturity mismatch analysis.

The table below shows DBS' encumbered and unencumbered liquid assets by instrument and counterparty against other assets in the same category under the balance sheet. The figures are based on the carrying amount at the balance sheet date.

	Liquid assets				Others[(d)]	Total
SGD million	**Encumbered**	**Unencumbered**	**Total[1]**	**Average[(c)]**	**[2]**	**[1] + [2]**
As at 31 Dec 2020						
Cash and balances with central banks[(a)]	8,416	14,834	23,250	19,886	27,368	50,618
Due from banks[(b)]	-	20,699	20,699	19,790	30,168	50,867
Government securities and treasury bills	10,002	41,496	51,498	53,631	202	51,700
Banks and corporate securities	3,306	49,632	52,938	53,114	12,518	65,456
Total	**21,724**	**126,661**	**148,385**	**146,421**	**70,256**	**218,641**

(a) Unencumbered balances with central banks comprise holdings that are unrestricted and available overnight. The encumbered portion represents the mandatory balances held with central banks, which includes a minimum cash balance (MCB) amount that may be available for use under a liquidity stress situation. The "Others" portion includes term placements with central banks
(b) Liquid assets comprise nostro accounts and eligible certificates of deposits
(c) Total liquid assets reflected on an average basis over the four quarters in 2020
(d) "Others" refer to assets that are not recognised as part of the available pool of liquid assets for liquidity management under stress due to (but not limited to) inadequate or non-rated credit quality, operational challenges in monetisation (e.g. holdings in physical scrips), and other considerations

In addition to the above table, collateral received in reverse repo-transactions amounting to SGD 12,860 million were recognised for liquidity management under stress.

7.4 Liquidity Coverage Ratio (LCR)

Under MAS Notice to Banks No. 649 "Minimum Liquid Assets (MLA) and Liquidity Coverage Ratio (LCR)" (MAS Notice 649), DBS, as a Domestic Systemically Important Bank (D-SIB) incorporated and headquartered in Singapore, is required to comply with the LCR standards. Group LCR has been maintained well above the minimum LCR requirements of 100% for both all-currency and SGD.

DBS' LCR is sensitive to balance sheet movements resulting from commercial loan/ deposit activities, wholesale inter-bank lending/ borrowing, and to the maturity tenor changes of these positions as they fall into or out of the LCR 30-day tenor. In order to meet the LCR requirements, DBS holds a pool of unencumbered High Quality Liquid Assets (HQLA) comprising predominantly cash, balances with central banks and highly rated bonds issued by governments or supranational entities.

7.5 Net Stable Funding Ratio (NSFR)

DBS is subject to the Net Stable Funding Ratio (NSFR) under MAS Notice to Banks No. 652 "Net Stable Funding Ratio (NSFR)" (MAS Notice 652). Group NSFR has been maintained consistently above the minimum regulatory requirement of 100%.

NSFR aims to improve the resiliency of banks by promoting long term funding stability. We manage our NSFR by maintaining a stable balance sheet supported by a diversified funding base with access to funding sources across retail and wholesale channels.

8 Operational risk

Operational risk is inherent in our business activities and may arise from inadequate or failed internal processes, people, systems, or from external events. DBS' objective is to keep operational risk at appropriate levels, taking into account the markets we operate in, the characteristics of the businesses as well as our economic and regulatory environment.

8.1 Operational risk management at DBS

DBS' approach to operational risk management comprises the following building blocks:

Policies
Risk methodologies
Processes, systems and reports

Policies
The Group Operational Risk Management (ORM) Policy sets our overall approach for managing operational risk in a structured, systematic and consistent manner.

There are policies, standards, tools and programmes in place to govern ORM practices across DBS. These include corporate operational risk policies and standards that are owned by the respective corporate oversight and control functions. The key policies address risk areas relating to technology, compliance, fraud, money laundering, financing of terrorism and sanctions, new product, outsourcing and ecosystem partnership.

Risk methodologies
DBS adopts the standardised approach to compute operational risk regulatory capital.

To manage and control operational risk, we use various tools, including risk and control self-assessment, operational risk event management and key risk indicator monitoring.

DBS' three lines of defence adopt one common risk taxonomy, and a consistent risk assessment approach to managing operational risk. Risk and control self-assessment is conducted by each business or support unit to identify key operational risk and assess the effectiveness of internal controls. When control issues are identified, the units develop action plans and track the resolution of the issues.

Operational risk events are classified in accordance with Basel standards. Such events, including any significant incidents that may impact DBS' reputation, must be reported based on certain established thresholds. Key risk indicators with pre-defined escalation triggers are employed to facilitate risk monitoring in a forward-looking manner.

Additional methodologies are in place to address subject-specific risks, including, but not limited to, the following:

Technology risk
Information Technology (IT) risk is managed through an enterprise technology risk management approach. This covers risk identification, assessment, mitigation, monitoring and reporting. In addition, the appropriate governance, IT policies and standards, control processes and risk mitigation programmes are in place to support the risk management approach.

Cyber security risk
Cyber security risk is an important and continuous focus of the bank. DBS devotes significant attention and resources to protect and improve the security of its computer systems, software, networks and other technology assets. Similar to IT risk, cyber security risk is managed through the same enterprise risk management approach, which cuts across all lines of business. The Chief Information Security Officer (CISO) oversees the cyber security function and the one-stop competency centre for all cyber security related matters, such as operational risks and data protection risks.

Compliance risk
Compliance risk refers to the risk of DBS not being able to successfully conduct our business because of any failure to comply with laws, regulatory requirements, industry codes or standards of business and professional conduct applicable to the financial sector.

This includes, in particular, laws and regulations applicable to the licensing and conducting of banking or other financial businesses, financial crime such as anti-money laundering (AML) and countering the financing of terrorism (CFT), fraud and bribery/ corruption. We maintain a compliance programme designed to identify, assess, measure, mitigate and report on such risks through a combination of policy and relevant systems and controls.

To counter financial crime and sanctions risks, DBS established minimum standards for our business and support units to manage our actual and/ or potential risk exposures. In addition, standards aimed to provide the end-to-end management for fraud and related issues at the unit and geographical levels, were implemented through the Fraud Management Programme.

DBS also provides relevant training and implements assurance processes. We strongly believe in the need to promote a strong compliance culture as well, and this is developed through the leadership of our Board and senior management.

New product, outsourcing and ecosystem partnership risks
Each new product, service, outsourcing arrangement or ecosystem partnership is subject to a risk review and sign-off process, where relevant risks are identified and assessed. Variations of existing products or services and existing outsourcing arrangements and ecosystem partnerships are also subject to a similar process.

Other mitigation programmes
A robust business continuity management programme is in place to ensure that essential banking services can continue in the event of unforeseen events or business disruptions. This includes a crisis management plan to enable quick response to manage incidents. Exercises are conducted annually, simulating different scenarios to test business continuity plans and crisis management protocol. The effectiveness of these exercises as well as DBS' business continuity readiness and our alignment to regulatory guidelines are communicated and attested by senior management to the BRMC annually.

To mitigate losses from specific risk events which are unexpected and significant, DBS purchases group-wide insurance policies under the Group Insurance Programme. These include policies relating to crime and professional indemnity, directors and officers liability, cyber risk, property damage and business interruption, general liability and terrorism.

Processes, systems and reports
Robust internal control processes and systems are integral to identifying, assessing, monitoring, managing and reporting operational risk.

All units are responsible for the day-to-day management of operational risk in their products, processes, systems and activities, in accordance with the various frameworks and policies. The RMG Operational Risk unit and other corporate oversight and control functions:

- Oversee and monitor the effectiveness of operational risk management
- Assess key operational risk issues with the units
- Report and/ or escalate key operational risks to risk committees with recommendations on appropriate risk mitigation strategies

DBS has in place an integrated governance, risk and compliance system with aligned risk assessment methodology, common taxonomy, and unified processes for the three lines of defence. In 2020, we implemented an operational risk landscape profile which provides the Board and senior management with an integrated view of DBS' operational risk profile periodically, across key operational risk areas and business lines.

8.2 Operational risk in 2020

The total operational risk losses in 2020 decreased to SGD 6 million (0.04% of DBS' total operating income), from SGD 33 million (0.23%) in 2019. The losses may be categorised into the following seven Basel risk event categories:

Basel risk event types	2020		2019	
	SGD million	%	SGD million	%
Execution, delivery and process management (EDPM)	3.67	61%	8.77	27%
External fraud	1.17	19%	5.19	16%
Business disruptions and system failures	0.48	8%	0.56	2%
Clients, products and business practices	0.63	11%	18.32	55%
Damage to physical assets	0.05	1%	0.05	0%
Internal fraud	0	0%	0	0%
Employment practices and workplace safety	0	0%	0	0%
Total[(a)]	**6.0[(b)]**	**100%**	**32.89[(c)]**	**100%**

Notes
(a) Reportable operational risk events are those with net loss greater than SGD 10,000 and are reported based on the date of detection
(b) This excludes the operational losses of Lakshmi Vilas Bank that was amalgamated with DBS India Ltd on 27 Nov 2020
(c) Adjusted to account for updates such as subsequent recoveries after 2019

EDPM, which comprised mainly processing errors, accounted for the highest share of our total losses in 2020.

9 Reputational risk

DBS views reputational risk as an outcome of any failure to manage risks in our day-to-day activities/ decisions, and from changes in the operating environment. These risks include:

- Financial risk (credit, market and liquidity risks)
- Inherent risk (operational and business/ strategic risks)

9.1 Reputational risk management at DBS

DBS' approach to reputational risk management comprises the following building blocks:

Policies
Risk methodologies
Processes, systems and reports

Policies
DBS adopts a four-step approach for reputational risk management, which is to prevent, detect, escalate and respond to reputational risk events.

As reputational risk is a consequence of the failure to manage other risk types, the definitions and principles for managing such risks are articulated in the respective risk policies. These are reinforced by sound corporate values that reflect ethical behaviours and practices throughout DBS.

At DBS, we have policies in place to protect the consistency of our brand and to safeguard our corporate identity and reputation.

Risk methodologies
Under the various risk policies, we have established a number of mechanisms for ongoing risk monitoring.

These mechanisms take the form of risk limits, key risk indicators and other operating metrics, and include the periodic risk and control self-assessment process. Apart from observations from internal sources, alerts from external parties/ stakeholders also serve as an important source to detect potential reputational risk events. In addition, there are policies relating to media communications, social media and corporate social responsibility to protect DBS' reputation. There are also escalation and response mechanisms in place for managing reputational risk.

While the respective risk policies address the individual risk types, the Reputational Risk Policy focuses specifically on our stakeholders' perception of how well DBS manages its reputational risks. Stakeholders include customers, government agencies and regulators, investors, rating agencies, business alliances, vendors, trade unions, the media, the general public, the Board and senior management, and DBS' employees.

We recognise that creating a sense of shared value through engagement with key stakeholder groups is imperative for our brand and reputation.

Read more about our stakeholder engagement on page 74.

Processes, systems and reports
Our units are responsible for the day-to-day management of reputational risk, and ensure that processes and procedures are in place to identify, assess and respond to this risk. This includes social media monitoring to pick up adverse comments on DBS. Events affecting DBS' reputational risk are also included in our reporting of risk profiles to senior management and Board-level committees.

9.2 Reputational risk in 2020

DBS' priority is to prevent the occurrence of a reputational risk event, instead of taking mitigating action when it occurs. There were no significant reputational risk incidents endangering the DBS franchise in 2020.