Risk management

We have implemented most of the Enhanced Disclosure Task Force (EDTF) recommendations for improved bank risk disclosures⁽¹⁾ in 2015. We have also implemented the temporary and permanent disclosure recommendations⁽²⁾ of the EDTF's November 2015 report "Impact of expected credit loss (ECL) approaches on bank risk disclosures" insofar as they are applicable to DBS.

For an overview of the recommendations and where we have incorporated the relevant disclosures, please refer to Appendix on page 103.

The table below gives an overview of the locations of our risk disclosures

	Risk management section		Other locations in Annual Report		Pillar 3 quantitative disclosures ⁽³⁾
Risk overview	1 Risk overview2 Risk-taking and our business segments	82 82	Capital management and planning	109	 Introduction Capital adequacy Exposures and risk-weighted assets (RWA)
Risk governance	3 Risk governance	83 84	Corporate governance report	48	
Risk Appetite	4.1 Risk constraining thresholds and use of economic capital4.2 Stress testing	85 86	Remuneration report	68	
Credit risk	 5.1 Credit risk management at DBS 5.2 Credit risk mitigants 5.3 Internal credit risk models 5.4 Credit risk in 2015 	86 89 89 91	Note 14 Financial assets and liabilities subject to netting agreement Note 40.1 Maximum exposure to credit risk Note 40.2 Loans and advances to customers Note 40.3 Credit quality of government securities and treasury bills and bank and corporate debt securities Note 40.4 Credit risk by geography and industry	131 156 157 161	 4.1 Credit risk assessed using internal ratings-based approach 4.2 Credit risk assessed using standardised approach 4.3 Credit risk mitigation 4.4 Counterparty credit risk-related exposures 5 Equity exposures under IRBA 6 Securitisation exposures 7.1 Credit exposures 7.2 Major credit exposures by geography and industry 7.3 Loans and advances to customers (by performing, non-performing) 7.4 Movements in specific and general allowances
Market risk	6.1 Market risk management at DBS6.2 Market risk in 2015	94 95			7.6 Interest rate risk in the banking book7.7 Equity exposures in the banking book
Liquidity risk	 7.1 Liquidity risk management at DBS 7.2 Liquidity risk in 2015 7.3 Liquid assets 7.4 Regulatory requirements 	96 98 99 99	Note 41.1 Contractual maturity profile of assets and liabilities	163	7.5 Total assets by residual contractual maturity
Operational risk	8.1 Operational risk management at DBS8.2 Operational risk in 2015	100 101			
Reputational risk	9.1 Reputational risk management at DBS9.2 Reputational risk in 2015	102			

- (1) See 'Enhancing the Risk Disclosure of Banks' published by the Financial Stability Board in October 2012
- (2) The additional considerations under the existing EDTF recommendations fall into the following three categories:
 - Permanent: Disclosures made in the pre-transition period, which should continue following adoption of the ECL framework
 - Temporary: Disclosures made in the pre-transition period, which should cease following adoption of the ECL framework
- Post ECL Adoption Permanent: Disclosures to be made following adoption of an ECL framework only (3) Please refer to http://www.dbs.com/investor/index.html for DBS' Pillar 3 Quantitative Disclosures

The sections marked by a grey line in the left margin form part of the Group's audited financial statements

1 Risk overview

Business and strategic risk

Is an over arching risk arising from changes in the business environment and from adverse decisions that can materially impact DBS' long term objectives. This risk is managed separately under other governance processes. See page 19 for a discussion of our material matters.

Credit risk (page 86)

Arises from the failure of borrowers or counterparties to meet their debt or contractual obligations.

Market risk (page 94)

Arises from adverse changes in interest rates, foreign exchange rates, equity prices, credit spreads and commodity prices, as well as their correlations and implied volatilities.

Liquidity risk (page 96)

Arises from the inability of DBS to meet obligations when they become due.

Operational risk (page 100)

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

Reputational risk (page 102)

Is the current or prospective risk to our shareholder value (including earnings and capital) arising from adverse perception of DBS' image on the part of its stakeholders. It affects DBS' ability to establish new relationships or services, continue servicing existing relationships, and have continued access to sources of funding. Reputational risk is typically an outcome of failure to manage the other risk types.

2 Risk taking and our business segments

In addition to the above risk dimensions, we also take a business segment view. Our focus on Asia naturally exposes us to concentration risk in the region. We manage our risks through industry diversification and concentration management of individual exposures. In addition, we use specialist knowledge of regional markets and industry segments to assess risk against a range of criteria.

As a commercial bank, a higher allocation of economic capital is given to our Institutional Banking and Consumer Banking businesses compared to the Treasury business. We also maintain a buffer for

other risks such as country risk, operational risk, reputational risk and model risk.

The chart below provides a high level overview of the risks arising from our business segments. The asset size gives an indication of the contribution of the business segments to the balance sheet, while the risk-weighted assets (RWA) is the regulatory measure of the risks incurred with respect to each business segment.

Please refer to Note 43 to the Financial statements on page 166 for more information on DBS' business segments.

	Consumer Banking/ Wealth Management	Institutional Banking	Treasury	Others ^(a)	Total
SGD million					
Assets ^(b)	90,685	224,196	91,257	46,579	452,717
Risk-weighted assets	32,868	160,278	60,270	20,613	274,029
% of RWA					
Credit risk	86%	94%	37%	72%	79%
Market risk			59%	23%	15%
Operational risk	14%	6%	4%	5%	6%

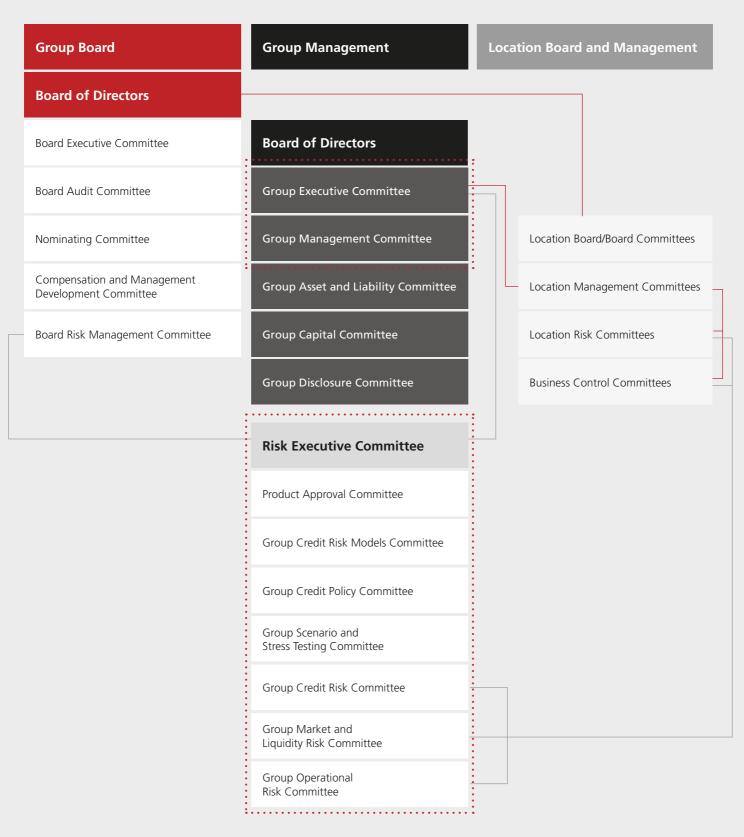
⁽a) Encompasses assets/RWA from capital and balance sheet management, funding and liquidity activities, DBS Vickers Group and The Islamic Bank of Asia Limited

⁽b) Before goodwill and intangibles

3 Risk governance

The Board directs the conduct of our affairs and provides sound leadership to the CEO and management. The Board has delegated authority to various Board committees to enable them to oversee specific responsibilities based on clearly defined terms of reference.

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



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

The BRMC provides oversight of the overall approaches for 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 Executive Committee (Risk ExCo)	The Risk ExCo provides group-wide oversight and direction relating to the management of all risk types and is the overall executive body mandated by the BRMC on risk matters.
Product Approval Committee (PAC)*	The PAC provides group-wide oversight and direction relating to new product approvals – an important risk mitigation element within DBS
Group Credit Risk Models Committee (GCRMC)*	Each committee, reporting to the Risk ExCo, is broadly mandated to serve as an executive forum for discussion and decisions on different
Group Credit Policy Committee (GCPC)*	aspects of risk and its management.
Group Scenario and Stress Testing Committee (GSSTC)*	Key responsibilities:
	 Assess and approve risk-taking activities
Group Credit Risk Committee (GCRC)	 Maintain oversight of the effectiveness of DBS' risk management infrastructure, including frameworks, decision criteria, authorities,
Group Market and Liquidity Risk Committee (GMLRC)	people, policies, standards, processes, information and systems • Approve risk policies including model governance standards, stress
Group Operational Risk Committee (GORC)	testing scenarios, endorse risk models and assess performance of the risk models
	 Identify specific concentrations of risk
	 Recommend scenarios and resulting macro-economic variable projections used for enterprise-wide stress tests
	The members in these committees comprise representatives from Rish Management Group (RMG) as well as key business and support units

The above committees (excluding those marked with asterisks) are supported by local risk committees in all major locations. The local risk committees provide oversight of local risk positions across all businesses and support units and ensure compliance with limits set by the group risk committees. They also approve location-specific risk policies and ensure compliance with local regulatory risk limits and requirements.

The Chief Risk Officer (CRO) – member of the Group Executive Committee who 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 also engages regulators on a regular basis to discuss risk matters.

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

- Management of the risks in DBS, including developing and maintaining systems and processes to identify, approve, measure, monitor, control and report risks
- Engagement of senior management on material matters relating to the various types of risks
- Development of risk controls and mitigation processes
- Ensuring the effectiveness of risk management and adherence to the Risk Appetite established by the Board

4 Risk Appetite

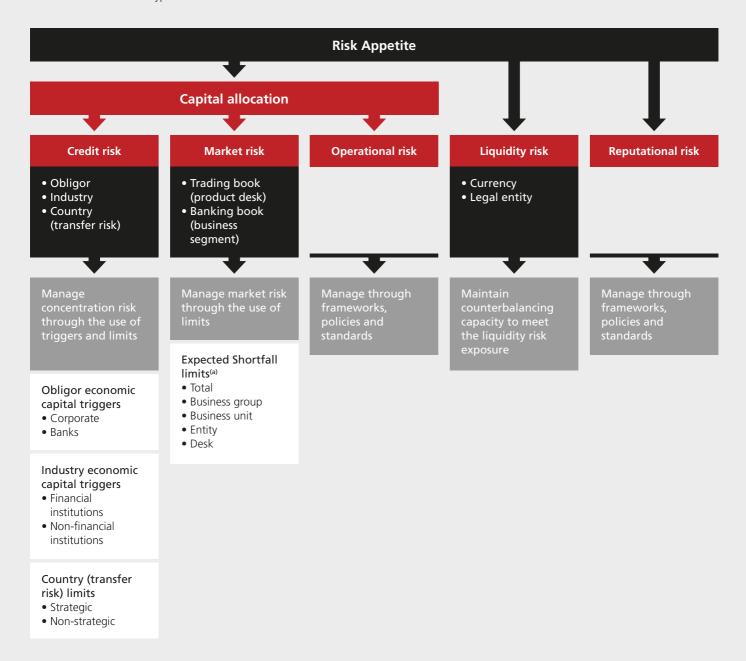
Our Risk Appetite is defined by the Risk Appetite Statement set by the Board and is governed by the Risk Appetite Framework. The framework also serves to reinforce our risk culture through 'tone from the top' articulation of risks that we are willing to accept. A strong organisational risk culture, including an appropriate incentive framework (please refer to Remuneration Report section on page 68), helps to further embed our Risk Appetite.

4.1 Risk constraining thresholds and use of economic capital

Our Risk Appetite considers the various risk types and is operationalised via thresholds, policies, processes and controls. The inclusion of threshold structures into the risk frameworks is integral in driving Risk Appetite into our businesses. Effective thresholds are essential in managing aggregate risks within acceptable levels. Portfolio risk limits for the quantifiable risk types are cascaded through a top-down approach and operationalised through formal frameworks. Other significant risk aspects are guided by qualitative expression of principles.

In order to ensure that the thresholds emanating from the Risk Appetite are fully risk sensitive to individual risk drivers as well as portfolio effects, we have adopted economic capital (EC) as our primary risk metric. EC is also deployed as a core component in our Internal Capital Adequacy Assessment Process (ICAAP).

The following chart provides a broad overview of how we cascade Risk Appetite throughout DBS. Please refer to Sections 5 to 9 for more information on each risk type.



4.2 Stress testing

Stress testing is an integral part of our risk management process and includes both sensitivity analysis and scenario analysis. It alerts senior management to our potential vulnerability to exceptional but plausible adverse events. It enables us to assess capital adequacy, identify potentially risky portfolio segments and inherent systematic risks. This in turn allows us to define appropriate contingency plans, exit strategies and mitigating actions before the onset of an adverse event

Stress testing is minimally conducted annually. Additional stress tests are carried out in response to micro and macro economic conditions. All stress tests are documented.

The capital planning process under ICAAP seeks to align our expected business trajectory under a range of scenarios and our Risk Appetite. This is performed by comparing the projected demand for capital and projected supply of capital in stress scenarios. Projected capital demand in respect of credit risk and market risk is a function of balance sheet assumptions and the confidence interval implied by the target credit rating specified in the Risk Appetite Statement.

5 Credit risk

Credit risk arises from our daily activities in various businesses – lending to retail, corporate and institutional customers; trading activities such as foreign exchange, derivatives and debt securities; and settlement of transactions. Credit risk is the most significant measurable risk faced by DBS.

Lending exposures are typically represented by the notional value or principal amount of on-balance sheet financial instruments. Financial guarantees and standby letters of credit, which represent the undertaking that DBS will make payments on behalf of a customer that is unable to meet its obligations to third parties, carry the same credit risk as loans even though they are contingent in nature. Pre-settlement credit exposures (PCE) for trading and securities transactions are measured taking into account collateral and netting arrangements. Settlement risk is the risk of loss due to the counterparty's failure to perform its obligation after DBS has performed its obligation under an exchange of cash or securities.

Please refer to Note 40.1 to the Financial statements on page 156 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

The dimensions of credit risk and the scope of its application are defined in the Group Credit Risk Management Framework. Senior management sets the overall direction and policy for managing credit risk at the enterprise level. The Group Core Credit Risk Policy (CCRP) sets forth the principles by which DBS conducts its credit risk management and control activities. This policy, supplemented by a number of operational policies, ensures consistency in identifying, assessing, underwriting, measuring, reporting and controlling credit risk across DBS, and provides guidance in the formulation of business-specific and/or location-specific credit risk policies.

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

Risk methodologies

.....

Credit risk is managed by thoroughly understanding our customers – the businesses they are in, and the economies in which they operate. This is facilitated through the use of credit ratings and lending limits. DBS uses an array of rating models for its corporate and retail portfolios. Most models are built internally using DBS' own loss data. Limits and "rules for the business" are driven by DBS' Risk Appetite Statement and TMRAC respectively.

Retail exposures are typically managed on a portfolio basis and assessed based on credit scoring models, credit bureau records, internal and externally available customers' behaviour records. They are further supplemented by Risk Acceptance Criteria.

Wholesale borrowers are assessed on an individual basis, reviewed and analysed by experienced credit risk managers taking into consideration the relevant credit risk factors. For portfolios within the SME segment, DBS also uses a programme-based approach for a balanced management of risks and rewards. Credit extensions are proposed by the business unit and are approved by the credit risk function based on independent credit assessment, while also taking into account the business strategies determined by senior management.

Please refer to Section 5.3 on page 89 for further discussion on our internal credit risk models.

Pre-settlement credit risk on derivatives arising from a counterparty's potential default is quantified by its current mark-to-market plus an appropriate add-on factor for potential future exposure. This methodology is used to calculate DBS' regulatory capital under the Current Exposure Method (CEM) and is included under DBS' overall credit limits to counterparties for internal risk management.

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

DBS actively monitors and manages its exposure to counterparties in over-the-counter (OTC) derivative trades to protect its balance sheet in the event of a counterparty default. Counterparty risk exposures which may be materially and 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 exposure to a particular counterparty is positively correlated with the probability of default of the counterparty due to the nature of transactions with 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.

Concentration risk management

DBS' risk management processes aim to ensure that an acceptable level of risk diversification is maintained across the Group in line with our Risk Appetite. For credit risk, we use EC as the measurement tool, since it combines the individual risk factors of Probability of Default (PD), Loss Given Default (LGD) and Exposure at Default (EAD) as well as portfolio concentration factors. We set granular EC thresholds to ensure that the allocated EC stays within the Risk Appetite. These thresholds are regularly monitored in respect of major industry groups and single counterparty exposures. In addition, we set notional limits for country exposures. Governance processes exist to ensure that exposures are regularly monitored against these thresholds and appropriate actions are taken if thresholds are breached. We continually monitor and assess the need to enhance the scope of thresholds.

Country risk

Country risk is the risk of loss which is specifically attributed to events in a specific country (or a group of countries). It includes political, exchange rate, economic, sovereign and transfer risks. Country risk is embedded in the Group Credit Risk Management Framework and CCRP. In addition, country risk is managed as part of concentration risk management under the Risk Appetite Framework.

The principles and approach in the management of transfer risk are set out in DBS' Country Risk Management Standard. This includes an internal transfer risk and sovereign risk rating system where the assessments are made independent of business decisions. Transfer risk limits are set in accordance to DBS' Risk Appetite Framework.

Limits for non-strategic countries are set using a model-based approach. Limits for strategic countries are set based on country-specific strategic business considerations and acceptable potential loss versus the Risk Appetite. There are active discussions among the senior management and credit management in right-sizing transfer risk exposures to take into account not only risks and rewards, but also whether such exposures are in line with our strategic intent. All country limits are subject to approval by the BRMC.

Stress testing

We perform various types of credit stress tests which are directed by the regulators or driven by internal requirements and management. Credit stress tests are performed at a portfolio or sub-portfolio level and are generally meant to assess the impact of changing economic conditions on asset quality, earnings performance, capital adequacy and liquidity.

A credit stress test working group is responsible for developing and maintaining a robust stress testing programme to include the execution of the stress testing process and effective analysis of programme results. Stress test results are reported and discussed in the GCRC, the Risk ExCo and the BRMC.

The stress testing programme is comprehensive in nature spanning all major functions and areas of business. It brings together an expert view of the macroeconomics, market, and portfolio information with the specific purpose of driving model and expert oriented stress testing results.

DBS generally 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. Probability of Default, Loss Given Default and Exposure at Default) 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, internal and regulatory capital. The results of the credit stress tests form an input 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.

Industry-wide stress testing

DBS participates in the annual industry-wide stress test (IWST) conducted by the Monetary Authority of Singapore (MAS) to facilitate its ongoing assessment of 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

We continue to invest in systems to support risk monitoring and reporting for our Institutional Banking and Consumer Banking businesses. The end-to-end credit process is constantly subject to review and improvement through various front-to-back initiatives involving the business units, RMG, operations unit and other key stakeholders.

Day-to-day monitoring of credit exposures, portfolio performance and the external environment that may have an impact on credit risk profiles is key to DBS' philosophy of effective credit risk management. Risk reporting on credit trends, which may include industry analysis, early warning alerts and key weak credits, is provided to the various credit committees, and key strategies and action plans are formulated and tracked.

Credit control functions ensure that credit risks taken comply with group-wide credit policies and guidelines. These functions ensure proper activation of approved limits and appropriate endorsement of credit excesses and policy exceptions, and monitor compliance with credit standards and covenants established by management and regulators.

Non-performing assets

Our 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). These guidelines require credit portfolios to be 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.

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	
Sub-standard	Indicates that the borrower exhibits definable weaknesses in its business, cash flow or financial position that may jeopardise repayment on existing terms. These credit facilities may be non-defaulting.
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.
Loss	Indicates that the amount of recovery is assessed to be insignificant.

The linkage between the above MAS categories and DBS' internal ratings is shown in Section 5.3 on page 90.

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 actions such as realising security (if held)
- Technical default: Borrower is more than 90 days past due on any credit obligation to DBS

This is consistent with the guidance provided under the MAS' Notice to Banks No. 637 "Notice on Risk Based Capital Adequacy Requirements for Banks incorporated in Singapore" (MAS Notice 637).

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

Other than the above, we do not grant concessions to borrowers in the normal course of business. Any restructuring of credit facilities are reviewed on a case by case basis and conducted only on commercial terms.

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

Please refer to Note 2.10 to the Financial statements on page 123 for our accounting policies on specific and general allowances for credit losses. In general, specific allowances are recognised for defaulting credit exposures rated sub-standard and below. The breakdown of our NPA by loan grading and industry and the related amounts of specific allowances can be found in Note 40.2 to the Financial statements on page 159. A breakdown of past due loans can also be found in the same note.

When required, we will take possession of 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 40.2 to the Financial statements on page 160. Repossessed collateral is classified in the balance sheet as other assets. The amounts of such other assets for 2015 and 2014 were not material.

5.2 Credit risk mitigants

Collateral received

Where possible, DBS takes collateral as a secondary recourse to the borrower. Collateral include cash, marketable securities, properties, trade receivables, inventory and equipment and other physical and financial collateral. We may also take fixed and floating charges on the assets of borrowers. We have put in place policies to determine the eligibility of collateral for credit risk mitigation. These include requiring specific collaterals to meet minimum operational requirements in order to be considered as effective risk mitigants.

Our collateral are generally diversified and valued periodically. Properties constitute the largest percentage whilst marketable securities and cash are immaterial.

For derivatives, repurchase agreement (repo) and other repostyle transactions with financial market counterparties, collateral arrangements are typically covered under market standard documentation (such as Master Repurchase Agreements and International Swaps and Derivatives Association (ISDA) Agreements). Collateral received is marked to market on a frequency mutually agreed with the counterparties. These are governed by internal guidelines with respect to the eligibility of collateral. 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 to a counterparty against what is due from that counterparty in a netting-eligible jurisdiction.

Collateral held against derivatives generally consist 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/liquid government bonds and currencies. Reverse repo transactions are generally limited to large institutions with reasonably good credit standing. The bank 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 customers' specific facts and circumstances to assist them in restructuring their repayment liabilities. However, should the need arise, disposal and recovery processes are in place for disposal of collateral held by DBS. We also maintain a panel of agents and solicitors for the expeditious disposal of non-liquid assets and specialised equipment.

Collateral posted

DBS is required to post additional collateral in the event of a rating downgrade. As at 31 December 2015, for a three-notch downgrade of its Standard & Poor's Ratings Services and Moody's Investors Services ratings, DBS Bank would have to post additional collateral amounting to SGD 57 million.

Other risk mitigants

DBS also uses guarantees as credit risk mitigants. Internal thresholds for considering guarantors to be eligible 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 a credit risk model. The models are placed through a rigorous review process prior to endorsement by the GCRMC and the Risk ExCo and have to be approved by the BRMC before use.

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, the supervisory LGD estimates

are applied. For retail portfolios under the Advanced IRBA, internal estimates are used. In addition, the ratings from the credit models are used as the basis to support the underwriting of credit risk, monitor the performance of the portfolios and determine business strategies.

The performance of the rating systems is monitored regularly by the GCRMC and the BRMC to ensure their ongoing adequacy and robustness. This serves to highlight material deterioration in the rating systems for management attention. In addition, an independent risk unit conducts formal validations annually for the respective rating systems. The validation processes are also subject to an independent review by Group Audit.

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 account is assigned to a risk pool, considering factors such as borrower characteristics and collateral type. Loss estimates are based on historical default and realised losses within a defined period. The definition of default is applied at the level of a particular facility, rather than at the level of the obligor.

Business-specific credit risk policies and procedures including underwriting criteria, scoring models, approving authorities, frequency of asset quality and business strategy reviews, as well as systems, processes and techniques to monitor portfolio performance against benchmarks are in place. Credit risk models for secured and unsecured portfolios are 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 assessed under the Foundation IRBA and include sovereign, bank, corporate and specialised lending exposures. The risk ratings for the wholesale exposures (other than securitisation exposures) have been mapped to corresponding external rating equivalents. A description of the rating grades is provided in the table below to give a qualitative explanation of the risk benchmarks.

Sovereign exposures are risk rated using internal risk rating models and guidelines in line with the IRBA portfolios. Factors relevant to country-specific macroeconomic risk, political risk, social risk and liquidity risk are reviewed objectively in the sovereign rating models to assess the sovereign credit risk in a disciplined and systematic approach.

Bank exposures are assessed using a bank rating model covering various credit risk factors such as capital levels and liquidity, asset quality, earnings, management and market sensitivity. The risk ratings derived are benchmarked against external credit risk ratings to ensure that the internal rating systems are well aligned and appropriately calibrated.

Large corporate credits are assessed using approved models and reviewed by designated credit approvers. Credit factors considered in the risk assessment process include the counterparty's financial standing and specific non-quantitative factors such as industry risk, access to funding, market standing and management strength.

The counterparty risk rating assigned to SMEs is primarily based on the counterparty's financial position and strength. Credit ratings under the IRBA portfolios are, at a minimum, reviewed on an annual basis unless credit conditions require more frequent assessment. The counterparty risk rating process is reinforced by the facility risk rating system, which considers other exposure risk mitigants, such as collateral and third party guarantees.

Grade (ACRR)	Description of rating grade	Equivalent external rating	MAS classific	cation
PD Grade 1	Taking into account the impact of relevant economic, social or geopolitical conditions, capacity to meet its financial commitment is exceptional.	AAA	Pass	Performing assets
PD Grade 2	Taking into account the impact of the relevant economic, social or geopolitical conditions, capacity to meet its financial commitment is excellent.	AA+, AA, AA-	Pass	
PD Grade 3	More susceptible to adverse economic, social, geopolitical conditions and other circumstances. Capacity to meet its financial commitment is strong.	A+, A, A-	Pass	
PD Grade 4A/4B	Adequate protection against adverse economic, social or geopolitical conditions or changing circumstances. More likely to lead to a weakened capacity of the borrower to meet its financial commitment.	BBB+/BBB	Pass	
PD Grade 5	Relatively worse off than a borrower rated "4B" but exhibits adequate protection parameters.	BBB-	Pass	
PD Grade 6A/6B	Satisfactory capacity to meet its financial commitment but capacity may become inadequate due to adverse business, financial, economic, social or geopolitical conditions and changing circumstances.	BB+/BB	Pass	
PD Grade 7A/7B	Marginal capacity to meet its financial commitment but capacity may become inadequate or uncertain due to adverse business, financial, economic, social or geopolitical conditions and changing circumstances.	BB-	Pass	
PD Grade 8A	Sub-marginal capacity to meet its financial commitment. Adverse business, financial, or economic conditions will likely impair the borrower's capacity or willingness to meet its financial commitment.	B+	Pass	
PD Grade 8B/8C ^(a)	Low capacity to meet its financial commitment. Adverse business, financial, or economic conditions will likely impair the borrower's capacity or willingness to meet its financial commitment.	B/B-	Special mention	
PD Grade 9	Vulnerable to non-payment and is dependent upon favourable business, financial, and economic conditions for the borrower to meet its financial commitment. Likely to have little capacity to meet its financial commitment under adverse conditions.	CCC-C	Sub- standard (non- defaulting)	Non- performing assets
PD Grade 10 and above	A borrower rated '10' and above is in default (as defined under MAS Notice 637).	D	Sub- standard and below (defaulting)	

⁽a) For companies scored by the HK SME Scoring Model, in addition to the ACRR, there is a further test to evaluate whether the borrower meets the criteria of Special mention. If it does not, the ACRR can remain as 8B/8C but is not classified as Special mention

5.3.3 Specialised lending exposures

Specialised lending IRBA portfolios include income-producing real estate, project finance, object finance, hotel 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 the credit risk-weighted exposures.

5.3.4 Securitisation exposures

DBS is not active in securitisation activities that are motivated by credit risk transfer or other strategic considerations. As a result, we do not securitise our own assets, nor do we acquire assets with a view to securitising them.

We arrange securitisation transactions for clients for fees. These transactions do not involve special purpose entities that are controlled by us. 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 such arranged transaction is subject to independent risk assessment. Where DBS provides an underwriting commitment, any securitisation exposure arising will be held in the trading book to be traded or sold down in accordance with internal policy and risk limits. In addition, we do not provide implicit support for any transactions we structure or in which we have invested.

We have processes in place to monitor the credit risk of our securitisation exposures.

We invest in clients' securitisation transactions from time to time. These may include securitisation transactions arranged by us or 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 review thereafter.

5.3.5 Credit exposures falling outside of internal credit risk models

DBS applies the Standardised Approach (SA) for portfolios that are individually immaterial in terms of both size and risk profile as well as for identified transitioning portfolios. These portfolios include:

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

The identified transitioning retail and wholesale exposures are expected to transit to the Advanced IRBA and Foundation IRBA respectively, subject to certification by MAS. In the meantime, the SA has been applied.

The portfolios under the SA are subjected to our overall governance framework and credit risk management practices. We continue to monitor the size and risk profile of these portfolios and will look to enhance risk measurement processes should these risk exposures become material.

We use 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. We follow the process prescribed in MAS Notice 637 to map the ratings to the relevant risk weights.

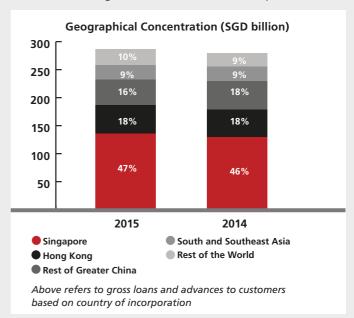
5.4 Credit risk in 2015

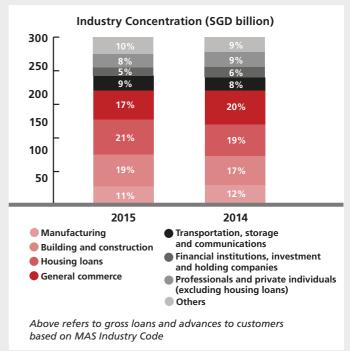
Concentration risk

Our geographic distribution of customer loans remained stable for the past year. Our exposure continued to be predominantly in our home market of Singapore accounting for 47% of the portfolio. Our exposure to customers in Singapore and Rest of the World

grew while our exposure to customers in Greater China excluding Hong Kong declined in 2015. This was reflective of the changing business environment in China as trade volumes dropped, and the proactive management of the risk by tightening the credit lending to SME customers.

Our overall exposure was well distributed and fairly stable across various industries with Building and construction and General commerce as the largest contributors in the wholesale portfolio.



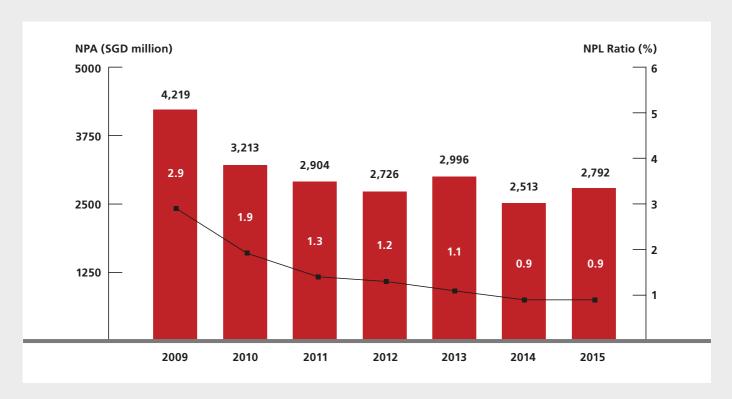


Please refer to Note 40.4 to the Financial statements on page 161 for DBS' breakdown of concentration of credit risk.

Non-performing assets

Total NPA, in absolute terms, increased by 11% from the previous year to SGD 2,792 million in 2015 due to higher NPA on our Greater China portfolio, which was impacted by the economic slowdown in China and RMB devaluation.

Despite the increase in NPA, our NPL ratio remained stable at 0.9% in 2015. This was the result of early identification and proactive management of problem accounts coupled with write-offs made during the year.



Collateral received

The tables below provide breakdowns by loan-to-value (LTV) bands for the borrowings secured by properties of the various market segments.

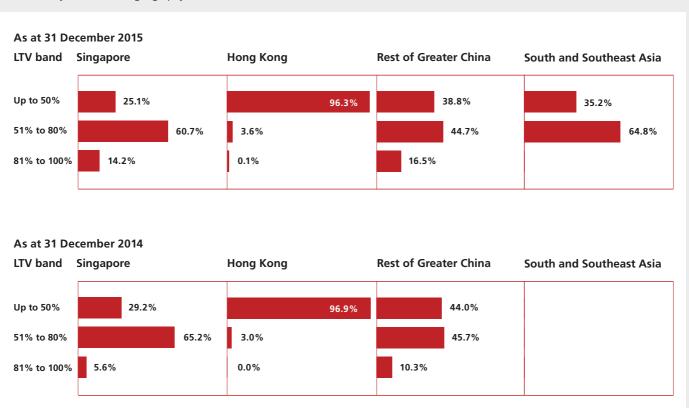
Residential mortgages loans

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

More than 85% of our residential mortgage loans resides in Singapore. New loans in Singapore are capped at LTV limits of up to 80% since 2010. The increases in loans in Singapore and Rest of Greater China with LTV between 81% and 100% were contributed by the downward adjustments of property prices in Singapore and Taiwan respectively.

Percentage of residential mortgage loans

Breakdown by LTV band and geography



Loans and advances to corporates secured by property

These loans are extended for the purpose of acquisition and/or development of real estate as well as for general working capital. 86% of the loans were fully collateralised, of which more than 90% had LTV of less than 80%. Our property loans were mainly concentrated in Singapore and Hong Kong, accounting for 86% of the total portfolio.

The LTV ratio is calculated as loans and advances divided by the combined value of property and other tangible collaterals. The latter include cash, marketable securities and bank guarantees, vessels and aircrafts. Where collateral assets are shared by multiple loans and advances, the collateral value is pro-rated.

Percentage of loans and advances to corporates secured by property

Breakdown by LTV band and geography



Loans and advances to banks

In line with market convention, loans and advances to banks are typically unsecured. We manage the risk of such exposures by keeping a tight control on the exposure tenor, and monitoring the credit quality of the bank counterparties.

Derivatives counterparty credit risk by markets and settlement methods

We continue to manage our derivatives counterparty risk exposures with netting and collateral arrangements to protect our balance sheet in the event of 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 & exchange-traded products

In notional terms, SGD million	As at 31 Dec 2015
OTC derivatives cleared through a central counterparty	479,053
OTC derivatives settled bilaterally	1,560,500
Total OTC derivatives	2,039,553
Exchange-traded derivatives	30,041
Total derivatives (only with external parties)	2,069,594

Please refer to Note 36 to the Financial statements on page 147 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 and Consumer Banking assets and liabilities, (ii) equity investments comprising of 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 SGD.

6.1 Market risk management at DBS

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



Policies

The Market Risk Framework sets out the overall approach while the Core Market Risk Policy (CMRP) establishes the base standards for market risk management within DBS. The Policy Implementation Guidance and Requirements (PIGR) complement the CMRP with more details for specific subject matters. Both CMRP and PIGR facilitate the identification, measurement, control, monitoring and reporting of market risk in a consistent manner. The Market Risk Stress Test Framework sets out the overall approach, standards and controls governing market risk stress testing across the Group. The criteria for determining the positions to be included in the trading book are stipulated in the Trading Book Policy Statement.

Risk methodologies

Value-at-Risk (VaR) is a method that computes the potential losses on risk positions as a result of movements in market rates and prices, over a specified time horizon and to a given level of confidence. Our VaR model is based on historical simulation with a one-day holding period. We use Expected Shortfall (ES), previously known as Tail VaR, to monitor and limit market risk exposures. With effect from 2 November 2015, ES is the average of potential losses beyond the given 97.5% level of confidence. Previously we used the 95% level of confidence. In the third quarter of 2015, we enhanced our credit spread risk modelling by deriving an implied spread from the bond prices and removing the use of proxies. The market risk economic capital that is allocated by the BRMC is linked to ES by a multiplier. ES is supplemented by risk control metrics such as sensitivities to risk factors and loss triggers for management action.

We conduct 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) which actually arise on those positions on the following business day. The backtesting P&L excludes fees and commissions, and revenues from intra-day trading. For backtesting, VaR at the 99% level of confidence 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.

VaR models such as historical simulation VaR permit the estimation of the aggregate portfolio market risk potential loss due to a range of market risk factors and instruments. VaR models have limitations; for example, past changes in market risk factors may not provide accurate predictions of the future market movements, and the risk arising from severe market risk related events may be understated.

To monitor our vulnerability to unexpected but plausible extreme market risk related events, we implemented a stress testing policy for market risk. Regular and multiple stress tests are run covering trading and non-trading portfolios through a combination of historical and hypothetical scenarios depicting risk factors movement. ES is the key risk metric used to manage our assets and liabilities. As an exception, credit spread risk under loans and receivables is managed under the credit risk management framework. We manage banking book interest rate risk arising from mismatches in the interest rate profile of assets, liabilities and capital instruments (and associated hedges), including basis risk arising from different interest rate benchmarks, interest rate re-pricing risk, yield curve risk and embedded optionality. Behavioural assumptions are applied in managing the interest rate risk of banking book deposits with indeterminate maturities. We measure interest rate risk in the banking book on a weekly basis.

Credit derivatives are used in the trading book with single name or index underlyings to support business strategy in building a regional fixed income franchise. We actively monitor our counterparty credit risk in credit derivative contracts. More than 90% of the gross notional value of our credit derivative positions as at 31 December 2015 was to 18 established names with which we maintain collateral agreements.

Processes, systems and reports

Robust internal control processes and systems are designed and implemented to support our approach for market risk management. Additionally, regular reviews of these control processes and systems are conducted. These reviews provide senior management with objective and timely assessments of the control processes and systems' appropriateness and effectiveness.

The day-to-day market risk monitoring, control and analysis is managed by the RMG Market and Liquidity Risk unit – an independent market risk management function that reports to the CRO. This group comprises risk control, risk analytics, production and reporting teams.

6.2 Market risk in 2015

DBS' ES considers the market risks of both the trading and banking books. Our ES (based on the 97.5% level of confidence) is tabulated below, showing the period-end, average, high and low ES.

		1 Jan 201	1 Jan 2015 to 31 Dec 2015		
SGD million	As at 31 Dec 2015	Average	High	Low	
Total	101	117	147	75	

		1 Jan 20	14 to 31 Dec 2014	
SGD million	As at 31 Dec 2014	Average	High	Low
Total	77	105	159	58

DBS' major market risk driver is interest rate risk in the trading and banking books. The average ES for 2015 was higher than 2014 mainly due to more volatile rates scenarios for ES calculation and updates of models for non-maturity deposits.

The following table shows the period-end, average, high and low diversified ES and ES by risk class for Treasury's trading portfolios. The ES reported below are based on the 97.5% level of confidence.

		1 Jan 201	15 to 31 Dec 2015	
SGD million	As at 31 Dec 2015	Average	High	Low
Diversified	16	20	32	15
Interest Rates	17	15	21	9
Foreign Exchange	11	8	19	3
Equity	3	3	5	2
Credit Spread	8	16	23	7
Commodity	#	1	2	#

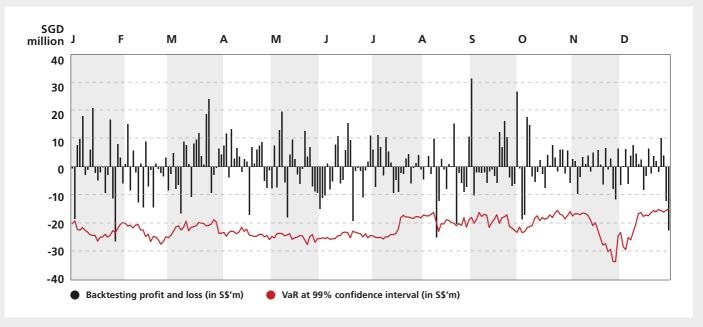
Amount under SGD 500,000

		1 Jan 201	14 to 31 Dec 2014	
SGD million	As at 31 Dec 2014	Average	High	Low
Diversified	19	14	25	9
Interest Rates	11	12	23	7
Foreign Exchange	6	5	10	3
Equity	2	2	3	1
Credit Spread	18	7	18	5
Commodity	#	1	3	#

Amount under SGD 500,000

In DBS, the main risk factors driving Treasury's trading portfolios in 2015 were interest rates, foreign exchange and credit spreads. Treasury's trading portfolios' average diversified ES increased by SGD 6 million (43%) and this was driven by the market volatility observed in 2015.

Similar to 2014, Treasury's trading portfolios experienced three backtesting exceptions in 2015. The exceptions occurred in January, August and December. Pronounced volatilities in SGD interest rate led to the exceptions in January and December. In August, the exception was triggered by the volatile swings in RMB interest rates and foreign exchange.



The key market risk drivers of our non-trading portfolios are SGD and USD interest rate positions. The economic value impact of changes in interest rates was simulated under various assumptions for the non-trading risk portfolio. The economic value changes were negative SGD 250 million and SGD 425 million (2014: negative SGD 275 million and SGD 489 million) based on parallel shifts to all yield curves of 100 basis points and 200 basis points respectively. The reported figures were based on the worse of an upward or downward parallel shift in the yield curves.

7 Liquidity risk

DBS' liquidity risk arises from our obligations to honour withdrawals of deposits, repayments of borrowed funds at maturity, and commitments to its customers to extend loans.

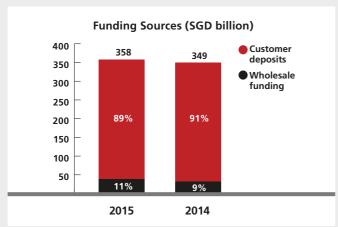
We seek to manage our liquidity in a manner that ensures that our liquidity obligations would continue to be honoured under normal as well as adverse circumstances.

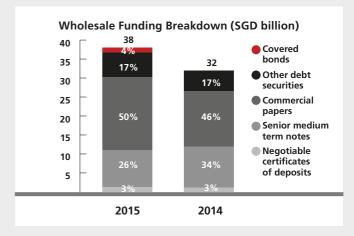
7.1 Liquidity risk management at DBS

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 strengthening our core deposit franchise as the foundation of the Group's long-term funding advantage.

Customer deposits grew by SGD 3 billion in 2015. Deposit quality improved as we rebalanced the mix towards longer tenor and more sticky deposits that are favourable for the liquidity coverage ratio (LCR). As at 31 December 2015, customer deposits continued to be the predominant source of funding at 89% of total funding sources.

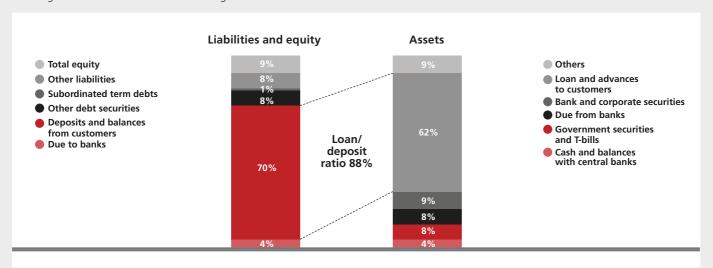




To complement core deposits, we also worked on broadening our access to wholesale funding through issuances of medium term notes, commercial papers, negotiable certificate of deposits, other debt securities and covered bonds. This gives us greater flexibility and efficiency in liquidity management. The value of such flexibility was seen in 2015 amid market and rate hike volatility. Commercial papers were stepped-up as a complementary source of cost-efficient short-term liabilities to fund a prudential increase in liquidity buffers. At the end of 2015, wholesale funding as a percentage of total funding sources increased marginally by 2% to 11%. This was achieved through actively engaging and growing a diversified global base of high quality investors.

2015 also saw DBS taking the lead as the inaugural issuer in the Singapore covered bond market. The issue priced favourably with a tight interest rate spread on the back of strong interest across 16 countries. This gave us access to liquidity from a new class of institutional investors at improved cost efficiency. We were also awarded the European Covered Bond Council Covered Bond Label – the first granted to an issuer outside the European Economic Area. This enhanced the visibility of our covered bond programme and the appeal of our issuances to global investors.

The diagrams below show our asset funding structure as at 31 December 2015.



Please refer to Note 29 to the Financial statements on page 141 for more details of our wholesale funding sources and Note 41.1 on page 163 for the contractual maturity profile of our assets and liabilities.

With increasing diversification of funding sources, optimising the mismatch in fund deployment against sources with respect to pricing, size, currency and tenor remains challenging. To this end, where practicable and transferable without loss in value, we make appropriate use of the swap markets for different 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 cashflow mismatches arising from the risk that counterparties may not roll over maturing swaps with us to support the continual funding of loans. We mitigate this risk by setting triggers on the amount of swaps transacted with the market and making conservative assumptions on the cashflow behaviour of swaps under our cashflow maturity gap analysis (see Section 7.2 on page 98).

Overseas locations are encouraged but not required to centralise majority of their borrowing and deployment of funds with head office, taking into account the relevant regulatory restrictions while maintaining a commensurate level of presence and participation in the local funding markets. Intra-group funding transactions are priced on an arm's length basis with reference to prevailing market rates and parameters set within the Group Funds Transfer Pricing policy.

During our annual budget and planning process, each overseas location conducts an in-depth review of their projected loan and deposit growth as well as their net funding and liquidity profile for the next year. The consolidated Group funding and liquidity profiles are reviewed and revised as necessary by senior management. Each overseas location is required to provide justification if head office funding support is required.

The Group Assets and Liabilities Committee and respective Location Assets and Liabilities Committee regularly review balance sheet composition, growth in loans and deposits, utilisation of wholesale funding, momentum in business activities, market competition, economic outlook, market conditions and other factors that may affect liquidity in the continual refinement of DBS' funding strategy.

Approach to liquidity risk management

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



Policies

The Group Liquidity Risk Management Policy sets out our overall approach towards liquidity risk management and describes the range of strategies employed by DBS to manage our liquidity. These include maintaining an adequate counterbalancing capacity to

address potential cashflow shortfalls and having diversified sources of liquidity. Counterbalancing capacity includes liquid assets and the capacity to borrow from the money markets as well as 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 Policy is supported by Standards which 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 consistent application throughout DBS.

Risk methodologies

The primary measure used to manage liquidity within the tolerance defined by the Board is the cashflow maturity mismatch analysis. This 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 cashflow shortfalls that may occur as forecasted in the cashflow movements across successive time bands. To ensure that liquidity is managed in line with the Risk Appetite, core parameters underpinning the performance of the analysis, 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 the counterbalancing capacity would be escalated to the relevant committees for deliberation and actions.

Stress testing is performed under the cashflow maturity mismatch analysis, and covers adverse scenarios involving shocks that are general market and/or name-specific in nature. Stress tests assess our vulnerability when liability run-offs increase, asset rollovers increase and/or liquid asset buffers reduce. 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 to the cashflow maturity mismatch analysis and are performed regularly to obtain deeper insights and finer control over the liquidity profile across locations. The liquidity risk control measures also include concentration measures on top depositors, wholesale borrowing and swapped funds ratios.

Processes, systems and reports

Robust internal control processes and systems underlie our overall approach to identifying, measuring, aggregating, controlling and monitoring liquidity risk across DBS. In 2015, we further enhanced the capabilities of our in-house data platform to improve the timeliness of our cash flow information as well as to perform more in depth analysis of our liquidity position.

The day-to-day liquidity risk monitoring, control reporting and analysis are managed by the RMG Market and Liquidity Risk unit – an independent liquidity risk management function that reports to the CRO. This unit comprises risk control, risk analytics, production and reporting teams.

7.2 Liquidity risk in 2015

We actively monitor and manage our liquidity profile based on the cashflow maturity mismatch analysis.

In forecasting cashflows 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 cashflows. An example would be maturity-indeterminate savings and current account deposits which are generally viewed as a source of stable funding for commercial banks and consistently exhibited stability even under historical periods of stress.

A conservative view is therefore adopted in the behavioural profiling of assets, liabilities and off-balance sheet commitments that have exhibited cashflow patterns that differ significantly from the contractual maturity profile shown under Note 41.1 of our Financial statements on page 163.

The table below shows our behavioural net and cumulative maturity mismatch between assets and liabilities over a 1-year period under a normal scenario without incorporating growth projections. DBS' liquidity was observed to remain adequate under the maturity mismatch analysis. Increase in near-term cumulative cash flows reflected higher excess cash and liquid asset holdings. Loan growth was supported largely by diversified stable funding sources which include deposits, medium term notes, commercial papers and covered bonds.

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 2015 Net liquidity mismatch	27,457	(102)	(9,456)	8,298	2,825
Cumulative mismatch	27,457	27,355	17,899	26,197	29,022
As at 31 Dec 2014 ^(b) Net liquidity mismatch	21,364	(6,553)	7,767	8,404	10,803
Cumulative mismatch	21,364	14,811	22,578	30,982	41,785

⁽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

7.3 Liquid assets

Liquid assets are assets that are readily available and can be easily monetised to meet liquidity shortfalls under times of stress. Such assets are internally defined under the governance of the relevant oversight committees, taking into account asset class, issuer type and credit rating, among other criteria, before they are reflected as available funds under the cashflow maturity mismatch analysis used to manage liquidity risk within the risk tolerance.

In addition to the characteristics of the liquid assets, our Treasury function should be able to operationally monetise the pool of liquid assets to meet liquidity shortfalls under times of stress. A further requirement is that these liquid assets are unencumbered by being free of 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 as well as protect 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 projected stress shortfalls under its cashflow maturity mismatch analysis and other factors.

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. Figures are based on the carrying amount as at the balance sheet date.

		Others ^(d)	Total			
SGD million	Encumbered	Unencumbered	Total [1]	Average ^(c)	[2]	[1] + [2]
As at 31 Dec 2015 Cash and balances with central banks ^(a)	6,751	10,774	17,525	15,689	1,304	18,829
Due from banks ^(b)	_	14,155	14,155	10,013	24,130	38,285
Government securities and treasury bills	2,650	30,930	33,580	35,397	921	34,501
Banks and corporate securities	857	25,938	26,795	25,832	13,278	40,073
Total	10,258	81,797	92,055	86,931	39,633	131,688

- (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 minimum cash balance (MCB) amount that may be available for use under a liquidity stress situation
- (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 2015
- (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 (for example, holdings in physical scrips), among other considerations

In addition to the above table, collateral received in reverse repo transactions amounting to SGD 5,341 million were recognised for liquidity management under stress.

As can be observed from the table, our funding strategy in the normal course of business does not rely on collateralised wholesale funding. Instead, liquid assets are maintained as a source of contingent funds to meet potential shortfalls that may arise under times of stress, as assessed under regulatory standards and our internal measures.

7.4 Regulatory requirements

On 28 November 2014, the MAS published MAS' Notice to Banks No. 649 "Minimum Liquid Assets (MLA) and Liquidity Coverage Ratio (LCR)" (MAS Notice 649), which sets out the implementation of the Basel III LCR in Singapore. DBS, as a domestic bank incorporated and headquartered in Singapore, is required to comply with the LCR standards under MAS Notice 649 from 1 January 2015. For the full year of 2015, Group LCR was maintained well above the minimum LCR requirements under MAS Notice 649.

Based on our internal assessment and participation in the Quantitative Impact Studies by the Basel Committee on Banking Supervision, DBS is well-positioned to meet the minimum standards of the Basel III Net Stable Funding Ratio (NSFR). The international timeline targeted for implementation is January 2018.

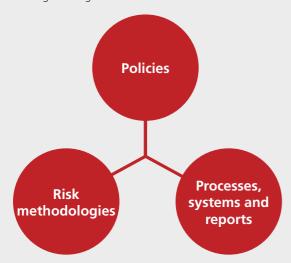
8 Operational risk

Operational risk includes processing errors, fraudulent acts, inappropriate behaviour of staff, vendors' misperformance, system failure and natural disasters. Operational risk is inherent in most of our businesses and activities.

Our 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 the competitive and regulatory environment we are subject to.

8.1 Operational risk management at DBS

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



Policies

The Group Operational Risk Management (ORM) Policy provides a group-wide 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 the Group. These include corporate operational risk policies and standards which are owned by the respective corporate oversight and control functions and include key subject-specific policies such as Technology Risk Management Framework, Group Compliance Policy, Fraud Management Policy and Group Anti-Money Laundering, Countering the Financing of Terrorism and Sanctions Policy, New Product Approval Policy and Outsourcing Risk Policy.

Risk methodologies

We adopt 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 indicators monitoring. Risk and control self-assessment is used by each business or support unit to identify key operational risk and assess the degree of effectiveness of the internal controls. For control issues identified, the units are responsible for developing action plans and tracking the timely resolution. Operational risk events are classified in accordance with Basel standards. Such events, including any significant incidents that may impact DBS' reputation, are required to 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 in accordance with a Technology Risk Management Framework. This covers risk

governance, communication, monitoring, assessment, mitigation and acceptance and is supported by a set of IT policies and standards, control processes and risk mitigation programmes.

We have also established policies and standards to manage and address cyber security risk. To enhance our management of this risk, we have appointed a Chief Information Security Officer who is responsible for our cyber security risk management strategy and programme.

Compliance risk

Compliance risk is the risk of impairment to our ability to successfully conduct our business as a result of any failure to comply with laws, regulatory requirements, industry codes or standards of professional conduct applicable to the conduct of business in the financial sector. This includes, in particular, laws and regulations applicable to the licensing and conduct of banking or other financial businesses, financial crime such as anti-money laundering and countering the financing of terrorism, 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. We also provide relevant training and execute assurance processes. We also strongly believe in the need to promote a strong compliance culture. This is established through the leadership of our Board and senior management and aims to comply with the letter and spirit of the laws and regulatory standards in the environment in which we operate.

Fraud risk

We have established minimum standards for our business and support units to prevent, detect, investigate and remediate against fraud and related events. This is based on the Fraud Management Programme through which standards are to be implemented on a unit and geographical level. These standards aim to provide end-to-end management of fraud and related issues within DBS.

Money laundering, financing of terrorism and sanctions risks

There are minimum standards for our business and support units to mitigate and manage our actual and/or potential exposure to money laundering, terrorist financing, sanctions, corruption, or other illicit financial activity. Accountabilities have also been established for the protection of the assets and reputation of DBS and the interests of customers and shareholders.

New product and outsourcing risks

Each new product, service or outsourcing initiative is subject to a risk review and sign-off process where relevant risks are identified and assessed by departments independent of the risk-taking unit proposing the product or service. Variations of existing products or services and outsourcing initiatives are also subject to a similar process.

Other mitigation programmes

Business continuity management plays an integral role in DBS' risk mitigation programme to manage business disruptions. A robust crisis management and business continuity management programme is in place within essential business services during unforeseen events. Planning for business resilience includes identification of key business processes via Business Impact Analysis as well as the documentation and maintenance of Business Continuity Plan (BCP). Overall BCP objectives are aimed at minimising the impact of business interruption arising from severe loss scenarios and to provide a reasonable level of service until normal business operations are resumed. The crisis management structure encompasses an incident management process from the point of incident to crisis declaration and activation of the relevant committees or teams to

manage the crisis. Exercises are conducted annually, simulating varying scenarios to test the BCPs and crisis management protocol. Scenarios include incidents such as technology incidents having enterprise-wide impact on essential banking services, natural disasters with wide geographical area impact, safety-at-risk incidents (e.g. terrorism) and other events leading to significant business disruption. Senior management provides an attestation to the BRMC on an annual basis including the state of business continuity readiness, extent of alignment to regulatory guidelines and disclosure of residual risks.

To mitigate losses from specific unexpected and significant event risks, DBS purchases group-wide insurance policies, under the Group Insurance Programme, from third-party insurers. DBS has acquired insurance policies relating to crime and professional indemnity; directors and officers liability; property damage and business interruption; general liability and terrorism.

Processes, systems and reports

Robust internal control processes and systems are integral to identifying, monitoring, managing and reporting operational risk. We have implemented a web-based system that supports multiple operational risk management processes and tools including

operational risk event reporting, risk and control self-assessment, key risk indicators, tracking of issues or action plans and operational risk reporting.

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. RMG Operational Risk and other corporate oversight and control functions provide oversight and monitor the effectiveness of operational risk management, assess key operational risk issues with the units to determine the impact across DBS, report and/or escalate key operational risks to relevant senior management and board-level committees with recommendations on appropriate risk mitigation strategies.

8.2 Operational risk in 2015

The total operational risk losses in 2015 decreased to SGD 10.8 million (0.10% of DBS' total operating income), compared to SGD 13.5 million (0.13%) in 2014. The loss profile (net loss greater than SGD 10,000 and based on the date of detection of the operational risk event), was mainly categorised into the following four Basel risk event categories: (i) internal fraud; (iii) external fraud; (iii) clients, products and business practices; (iv) execution, delivery and process management; and (v) business disruption and system failure.

Decel visk sweet types	2015		2014	
Basel risk event types	SGD million	%	SGD million	%
Execution, delivery and process management	5.96	55%	1.91	14%
External fraud	4.39	41%	9.04	67%
Clients, products and business practices	0.28	3%	1.61	12%
Internal fraud	0.14	1%	0.97	7%
Business disruption and system failure	0.03	0%	0	0%
Total	10.80	100%	13.54	100%

Note: No losses were reported for (vi) employment practices and workplace safety; and (vii) damage to physical assets

Execution, delivery and process management and external fraud accounted for 96% of the Group's operational risks losses in 2015. Losses were highest in the category of execution, delivery and process management which arose from a few isolated incidents and mitigating actions have been taken accordingly. The losses from external fraud were due largely to credit card fraud. Nevertheless, our credit card fraud losses were lower than the industry benchmark.

9 Reputational risk

We view reputational risk as an outcome of any failure to manage risks in our day-to-day activities/decisions as well as from changes in the operating environment. These risks include:

- a. Financial risk (credit, market and liquidity risks)
- b. 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

We adopt a four-step approach i.e. prevent, detect, escalate and respond to reputational risk events. As reputational risk is a consequence from 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 embed ethical behaviours and practices throughout DBS.

Policies are in place to protect the consistency of the DBS 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 take the form of risk limits, key risk indicators and other operating metrics, as well as 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 risk 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 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, media, general public, Board and senior management, and employees. We recognise that creating a sense of shared value through engagement with key stakeholder groups is imperative for our brand and reputation. For more information on how we engage our stakeholders, see page 20.

Processes, systems and reports

Units are responsible for the day-to-day management of reputational risk by ensuring that processes and procedures are in place to identify, assess and respond to reputational risk. Events of reputational risk impact are also featured in the reporting of risk profiles to senior management and board-level committees.

9.2 Reputational risk in 2015

DBS' priority is to prevent the occurrence of a reputational risk event rather than to take mitigating actions when it materialises. There were no significant reputational risk incidents which could endanger the DBS franchise in 2015.

Appendix

General recommendations		Where have we disclosed this? (in Risk management section unless otherwise stated)	
1	Present all related risk information together in any particular report.	Refer to the table on page 81	
2	Define the bank's risk terminology and risk measures and present key parameter values used.	Sections 1, 5.1, 6.1, 7.1, 8.1	
	Permanent considerations in respect of impact of expected credit loss approaches:		
	Describe how the bank interprets and applies the key concepts within an ECL approach.	Refer to Note 1 below	
	Disclose the credit loss modelling techniques developed to implement the ECL approach.	Refer to Note 1 below	
3	Describe and discuss top and emerging risks, incorporating relevant information in the bank's external reports on a timely basis.	Refer to CRO statement	
	Temporary considerations in respect of impact of expected credit loss approaches:		
	Provide disclosures describing how the concepts applied and modelling techniques under the current impairment approaches compare with the new ECL approach to highlight factors which may drive changes in ECL that may not have been relevant in current impairment approaches.	Refer to Note 1 below	
4	Once the applicable rules are finalised, outline plans to meet each new key regulatory ratio, e.g. the net stable funding ratio, liquidity coverage ratio and leverage ratio and, once the applicable rules are in force, provide such key ratios.	Section 7.4 Refer to Capital management and planning section	
	Temporary considerations in respect of impact of expected credit loss approaches:		
	Banks should consider describing the intended implementation strategy including the current timeline for the implementation.	Refer to Note 1 below	
	Disclose how the risk management organisation, processes and key functions have been organised to run the ECL methodology.	Refer to Note 1 below	
Risk g	governance and risk management strategies/business model		
5	Summarise prominently the bank's risk management organisation, processes and key functions.	Section 3	
6	Provide a description of the bank's risk culture, and how procedures and strategies are applied to support the culture.	Section 4 Refer to Corporate Governance section	

Gene	ral recommendations	management section unless otherwise stated)
7	Describe the key risks that arise from the bank's business models and activities, the bank's Risk Appetite in the context of its business models and how the bank manages such risks.	Sections 1, 2 and 4
8	Describe the use of stress testing within the bank's risk governance and capital frameworks. Stress testing disclosures should provide a narrative overview of the bank's internal stress testing process and governance.	Sections 4.2, 5.1, 6.1, 7.1
	Temporary considerations in respect of impact of expected credit loss approaches:	
	Describe the relationship, if any, between the stress testing programs and the implementation of ECL accounting requirements.	Not applicable
Capit	al adequacy and risk-weighted assets	
9	Provide minimum Pillar 1 capital requirements, including capital surcharges for G-SIBs and the application of countercyclical and capital conservation buffers or the minimum internal ratio established by management.	Refer to Capital management and planning section and Pillar 3 disclosures published on DBS website
10	Summarise information contained in the composition of capital templates adopted by the Basel Committee to provide an overview of the main components of capital, including capital instruments and regulatory adjustments. A reconciliation of the accounting balance sheet to the regulatory balance sheet should be disclosed.	Refer to Pillar 3 disclosures published on DBS website
11	Present a flow statement of movements since the prior reporting date in regulatory capital, including changes in common equity tier 1, tier 1 and tier 2 capital.	Refer to Capital management and planning section
12	Qualitatively and quantitatively discuss capital planning within a more general discussion of management's strategic planning, including a description of management's view of the required or targeted level of capital and how this will be established.	Refer to Capital management and planning section
	Temporary considerations in respect of impact of expected credit loss approaches:	
	Banks should consider explaining how ECL requirements are anticipated to have an impact on capital planning, (particularly in meeting capital adequacy requirements) including any strategic changes expected by management, to the extent the impact is material. To the extent regulatory requirements are unclear or not yet fully determined, the effects of such uncertainty should be discussed.	Not applicable (regulatory requirements have not yet been fully determined)
13	Provide granular information to explain how risk-weighted assets (RWAs) relate to business activities and related risks.	Section 2

General recommendations		Where have we disclosed this? (in Risk management section unless otherwise stated)	
14	Present a table showing the capital requirements for each method used for calculating RWAs for credit risk, including counterparty credit risk, for each Basel asset class as well as for major portfolios within those classes. For market risk and operational risk, present a table showing the capital requirements for each method used for calculating them.	Refer to Pillar 3 disclosures published on DBS website	
15	Tabulate credit risk in the banking book showing average probability of default (PD) and LGD as well as exposure at default (EAD), total RWAs and RWA density for Basel asset classes and major portfolios within the Basel asset classes at a suitable level of granularity based on internal ratings grades.	Refer to Pillar 3 disclosures published on DBS website	
16	Present a flow statement that reconciles movements in RWAs for the period for each RWA risk type.	Not implemented	
17	Provide a narrative putting Basel Pillar 3 back-testing requirements into context, including how the bank has assessed model performance and validated its models against default and loss.	Section 6.1, 6.2	
Liquid	dity		
18	Describe how the bank manages its potential liquidity needs and provide a quantitative analysis of the components of the liquidity reserve held to meet these needs, ideally by providing averages as well as period-end balances.	Sections 7.1, 7.3	
Fundi	ing		
19	Summarise encumbered and unencumbered assets in a tabular format by balance sheet categories, including collateral received that can be rehypothecated or otherwise redeployed. This is to facilitate an understanding of available and unrestricted assets to support potential funding and collateral needs.	Section 7.3	
20	Tabulate consolidated total assets, liabilities and off-balance sheet commitments by remaining contractual maturity at the balance sheet date. Present separately (i) senior unsecured borrowing (ii) senior secured borrowing (separately for covered bonds and repos) and (iii) subordinated borrowing. Banks should provide a narrative discussion of management's approach to determining the behavioural characteristics of financial assets and liabilities.	Section 7.2 Financial statements Note 41.1	
21	Discuss the bank's funding strategy, including key sources and any funding concentrations, to enable effective insight into available funding sources, reliance on wholesale funding, any geographical or currency risks and changes in those sources	Section 7.1	

Where have we disclosed this? (in Risk management section unless otherwise stated)

General recommendations

Market risk

Provide information that facilitates users' understanding of the linkages between line items in the balance sheet and the income statement with positions included in the traded market risk disclosures (using the bank's primary risk management measures such as Value at Risk (VaR)) and non-traded market risk disclosures such as risk factor sensitivities, economic value and earnings scenarios and/or sensitivities.

Section 6.1

Provide further qualitative and quantitative breakdowns of significant trading and non-trading market risk factors that may be relevant to the bank's portfolios beyond interest rates, foreign exchange, commodity and equity measures.

Sections 6.1, 6.2

24 Provide qualitative and quantitative disclosures that describe significant market risk measurement model limitations, assumptions, validation procedures, use of proxies, changes in risk measures and models through time and descriptions of the reasons for back-testing exceptions, and how these results are used to enhance the parameters of the model.

Sections 6.1, 6.2

25 Provide a description of the primary risk management techniques employed by the bank to measure and assess the risk of loss beyond reported risk measures and parameters, such as VaR, earnings or economic value scenario results, through methods such as stress tests, expected shortfall, economic capital, scenario analysis, stressed VaR or other alternative approaches. The disclosure should discuss how market liquidity horizons are considered and applied within such measures.

Sections 6.1, 6.2

Credit risk

Provide information that facilitates users' understanding of the bank's credit risk profile, including any significant credit risk concentrations.

Section 5.4 Financial statements Note 40.4

Temporary considerations in respect of impact of expected credit loss approaches:

Banks should consider whether existing segmentation for disclosure purposes is sufficiently granular to appropriately understand credit risk under an ECL approach.

Not applicable (quantitative assessment not yet available)

Once practical and when disclosures would be reliable, provide users with a quantitative assessment of the potential impact of applying an ECL approach.

Permanent considerations in respect of impact of expected credit loss approaches:

Where it aids understanding of credit risk exposures, provide disclosure of vintage.

Not applicable

General recommendations		Where have we disclosed this? (in Risk management section unless otherwise stated)	
27	Describe the policies for identifying impaired or non-performing loans, including how the bank defines impaired or non-performing, restructured and returned-to-performing (cured) loans as well as explanations of loan forbearance policies.	Section 5.1	
28	Provide a reconciliation of the opening and closing balances of non-performing or impaired loans in the period and the allowance for loan losses. Disclosures should include an explanation of the effects of loan acquisitions on ratio trends, and qualitative and quantitative information about restructured loans.	Sections 5.1, 5.4 Financial statements Note 40.2	
29	Provide a quantitative and qualitative analysis of the bank's counterparty credit risk that arises from its derivatives transactions.	Section 5.1, 5.4	
30	Provide qualitative information on credit risk mitigation, including collateral held for all sources of credit risk and quantitative information where meaningful.	Section 5.2, 5.4	
Othe	r risks		
31	Describe 'other risk' types based on management's classifications and discuss how each one is identified, governed, measured and managed. In addition to risks such as operational risk, reputational risk, fraud risk and legal risk, it may be relevant to include topical risks such as business continuity, regulatory compliance, technology, and outsourcing.	Section 1, 8.1, 9	
32	Discuss publicly known risk events related to other risks, including operational, regulatory compliance and legal risks, where material or potentially material loss events have occurred. Such disclosures should concentrate on the effect on the business, the lessons learned and the resulting changes to risk processes already implemented or in progress.	Section 8.2	

Note 1: New impairment methodology

In 2018, International Financial Reporting Standard 9 (IFRS 9) will take effect. This new accounting standard will govern how reporting entities classify and measure financial instruments, take impairment (or allowance) charges and account for hedges.

Current impairment approach

At present, for impairment assessment, Singapore banks comply with the provisions of MAS Notice 612 where banks maintain, in addition to specific allowances, a prudent level of general allowances of at least 1% of uncollateralised exposures. This is an intended departure from the incurred loss provisioning approach prescribed under International Accounting Standard 39, and possible changes to the current regulatory specifications will determine how IFRS 9's expected credit loss (ECL) model (as discussed below) is eventually implemented. Any such changes are, however, unlikely to result in additional allowance charges for DBS at the point of adoption. The Group has begun preparations in the meantime, leveraging existing credit rating systems, models, processes and tools.

IFRS 9 impairment methodology

Under IFRS 9, impairment charges will be determined using an ECL model, which classifies financial assets into three categories or stages, each of which is associated with an ECL requirement that is reflective of the assessed credit risk profile:

- A financial asset is classified under Stage 1 if it was not credit-impaired upon origination and there has not been a significant increase in its credit risk since. Under this stage, the ECL of a financial asset will be determined using the probability of default over the next 12 months.
- A financial asset is classified under Stage 2 if it was not credit-impaired upon origination but has since suffered a significant increase in credit risk. The ECL will be determined using the probability of default over its lifetime.
- A financial asset which has been credit-impaired with objective evidence of default is classified under Stage 3.
 The assessed ECL is expected to be unchanged from the existing specific allowances taken for such assets.

Further guidance was specified by the Basel Committee in its December 2015 report, "Guidance on credit risk and accounting for expected credit losses".

Implementation plan

A steering committee, chaired by the CFO, has been established to oversee IFRS 9 implementation, including the development of the ECL model. It is envisaged that adjustments will be made to existing credit rating systems, models, processes and tools to accommodate IFRS 9 requirements, in particular for point-in-time and lifetime estimates of credit losses. The ECL assessment in each instance will also take into account, through the exercise of management judgement, reasonable and supportable forward-looking information, such as forecast GDP, inflation, unemployment, interest rates and property prices.

The steering committee is supported by a core working group which will develop a blueprint to operationalise the applicable governance, processes and controls around the ECL model. Periodic progress updates will be provided to the Audit Committee.

Disclosures

DBS intends to adopt the disclosure recommendations outlined in the EDTF's November 2015 report, "Impact of expected credit loss approaches on bank risk disclosures". In the intervening period prior to 2018, we will continue to provide the requisite disclosures, where applicable.