

# Risk Management

(This section forms an integral part of OCBC's audited financial statements)

## DEVELOPMENTS IN 2011

During the year, OCBC Group remained focused on our key clients and markets in Asia. This strategy provided us with healthy and strong broad based growth, including increased contribution from our wealth management business through Bank of Singapore ("BOS"). Loan origination was predominantly focused on firms with strong risk ratings as we carefully increased our activities within internal risk limits. Our franchise in China further grew with emphasis on secured lending and loans to selected top tier corporates and financial institutions. We also continued to integrate and consolidate our wealth management platform into BOS and align its risk approaches and practices towards Group standards.

Despite lingering concerns over a global slowdown caused by problems of several European economies, we continued to strengthen our liquidity sources with new and expanded international issuances aggregating some US\$13 billion, including a US\$5 billion commercial paper programme. In core markets of Singapore, Malaysia, Indonesia and China, we managed to further boost our retail and corporate deposit bases. OCBC's asset quality remains solid, and the sound capital ratio trend continues to improve, well ahead of Basel III capital requirements. As at 31 December 2011, the non-performing loan ratio was 0.9% and capital adequacy ratio was 15.7%.

OCBC Group takes a proactive and forward-looking stance in identifying emerging risks. We have minimal exposure to troubled European economies and we continue to pare down our overall exposure to Eurozone counterparties. As we look ahead, we remain vigilant against slowing global economic growth, uncertain outcomes from the Eurozone crisis and political instability in the Middle East. Our strong asset quality and capital position, underpinned by sound risk practices across the OCBC Group, position us well to manage the unfolding uncertainties and challenges. We expect to further deepen our ties with our existing customers as many global banks, weakened in consolidating their resources and exposures, reduce their footprint in the region.

## RISK MANAGEMENT IN OCBC GROUP

At OCBC Group, we believe that sound risk management is essential to ensuring success in our risk-taking activities. Our philosophy is to ensure risks and returns remain consistent with our established risk appetite. To achieve this, we regularly refine our risk management approaches to ensure we thoroughly understand the risks we are taking to identify any emerging portfolio threats at an early stage, and to develop timely and appropriate risk-response strategies.

The key elements of OCBC Group's enterprise-wide risk management strategy are:

- **Risk appetite** – The Board of Directors approves the Group's risk appetite, and risks are managed in alignment with the risk appetite. Risk-taking decisions must be consistent with strategic business goals and returns should compensate for the risk taken.

- **Risk frameworks** – The Group's risk management frameworks for all risk types are documented, comprehensive, and consistent.
- **Holistic risk management** – Risks are managed holistically, with a view to understand the potential interactions among risk types.
- **Qualitative and quantitative evaluations** – Risks are evaluated both qualitatively and with appropriate quantitative analyses and robust stress testing. Risk models are regularly reviewed to ensure they are appropriate and effective.

The Board of Directors and senior management provide the direction to the Group's effective risk management that emphasises well-considered risk-taking and proactive risk management. This is reinforced with appropriate risk management staff, ongoing investments in risk systems, regular review and enhancement of risk management policies and procedures for consistent application, overlaid with a strong internal control environment throughout the Group. Accountability for managing risks is jointly owned among customer-facing and product business units, dedicated functional risk management units, as well as other support units such as Operations and Technology. Group Audit also provides independent assurance that the Group's risk management system, control and governance processes are adequate and effective. Rigorous portfolio management tools such as stress testing and scenario analyses identify possible events or market conditions that could adversely affect the Group. These results are taken into account in the Group's capital adequacy assessment.

The discussion in this risk management chapter covers the risk management practices, policies, and frameworks of OCBC Group, and does not cover Great Eastern Holdings ("GEH") and PT Bank OCBC NISP Tbk ("NISP"). Group management collaborates with GEH and NISP on aligning their risk management infrastructure to Group standards through knowledge transfer and training assistance, and to ensure the risk practices are appropriate for their businesses. GEH and NISP are listed on Singapore Exchange and Indonesia Stock Exchange, respectively. As listed companies, GEH and NISP publish their own annual reports, which contain information on their risk management frameworks and practices (refer to Note 39 in the Group's Financial Statements for information on GEH's risk management).

All banking subsidiaries, including Bank of Singapore, are required to implement risk management policies that conform to Group standards. Approving authority and limit structures are consistent with Head Office to ensure accountability and effective risk management.

## RISK GOVERNANCE AND ORGANISATION

The Board of Directors establishes the Group's risk appetite and risk principles. The Board Risk Management Committee is the principal Board committee that oversees the Group's risk management. It reviews and approves the Group's overall risk management philosophy, risk management frameworks, major risk policies,

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and risk models. The Board Risk Management Committee also oversees the establishment and operation of the risk management systems, and receives regular reviews as to their effectiveness. The Group's various risk exposures, risk profiles, risk concentrations, and trends are regularly reported to the Board of Directors and senior management for discussion and appropriate action.

The Board Risk Management Committee is supported by Group Risk Management Division, which has functional responsibility on a day-to-day basis for providing independent risk control and managing credit, market, operational, liquidity, and other key risks. Within the division, risk officers are dedicated to establishing Group-wide policies, risk measurement and methodology, as well as monitoring the Group's risk profiles and portfolio concentrations. The Group's risk management and reporting systems are designed to ensure that risks are comprehensively captured in order to support well-considered decision making, and that the relevant risk information is effectively conveyed to the appropriate senior management executives for those risks to be addressed and risk response strategies to be formulated. To ensure the objectivity of the risk management functions, compensation of risk officers is determined independently of other business areas and is reviewed regularly to ensure compensation remains competitive with market levels.

Credit officers are involved in transaction approvals, and personal approval authority limits are set based on the relevant experience of the officers and portfolio coverage. Representatives from the division also provide expertise during the design and approval process for new products offered by the Group. This ensures that new or emerging risks from new products are adequately identified, measured, and managed within existing risk systems and processes.

Various risk management committees have been established for active senior management oversight, understanding, and dialogue on policies, profiles, and activities pertaining to the relevant risk types. These include the Credit Risk Management Committee, the Market Risk Management Committee, the Asset and Liability Management Committee, and the Operational Risk Management and Information Security Committee. Both risk-taking and risk control units are represented on these committees, emphasising shared risk management responsibilities. Group Audit conducts regular independent reviews of loan portfolios and business processes to ensure compliance with the Group's risk management frameworks, policies, processes, and methodologies.

### BASEL II

OCBC Group has implemented Monetary Authority of Singapore ("MAS") Notice 637 on Risk Based Capital Adequacy Requirements for banks incorporated in Singapore with effect from 1 January 2008. MAS Notice 637 adopts the Basel Committee on Banking Supervision's proposal on "International Convergence of Capital Measurement and Capital Standards," commonly referred to as Basel II. This framework provides a stronger linkage between capital requirements and the level of risks undertaken by banks to enhance their risk management practices and establishes minimum capital

requirements to support credit, market, and operational risks. As part of enhanced public disclosures on risk profile and capital adequacy required under MAS Notice 637, the Group has made additional disclosures since 2008. Please refer to the OCBC Group Basel II Pillar 3 Risk Disclosure section in the annual report for more information.

The Group has adopted the Foundation Internal Ratings-Based ("F-IRB") approach and supervisory slotting criteria to calculate credit risk-weighted assets for major non-retail portfolios, and the Advanced Internal Ratings-Based ("A-IRB") approach for major retail and small business lending portfolios. Other credit portfolios are on the standardised approach ("SA") and they will be progressively migrated to the internal ratings-based approaches. The regulatory capital to be set aside for credit risk-weighted assets depends on various factors, including internal risk grades, product type, counterparty type, and maturity.

The Group has adopted the standardised approaches for market risk and operational risk. Market risk-weighted assets are marked to market and are risk weighted according to the instrument category, maturity period, credit quality grade, and other factors. Operational risk-weighted assets are derived by applying specified beta factors or percentages to the annual gross income for the prescribed business lines in accordance with regulatory guidelines. Initiatives are in place to move toward Internal Model Approach for market risk. The Group is also conducting the feasibility study on the implementation of Advanced Measurement Approach for operational risk.

The Group has also established an Internal Capital Adequacy Assessment Process ("ICAAP"). Capital adequacy assessments and plans, incorporating stress test results, are submitted annually to MAS.

Implementing the Basel II framework is an integral part of our efforts to refine and strengthen, as well as to ensure our management of risks is appropriate for the risks we undertake. Group management remains vigilant to ongoing industry and regulatory developments, including risk-adjusted compensation and new standards established in the Basel III Framework published in December 2010. We are constantly reviewing to further improve and refine our businesses and risk management capabilities as well as engaging in dialogue with industry peers and regulators to position ourselves for the far-reaching consequences of these reforms.

### CREDIT RISK MANAGEMENT

Credit risk arises from the risk of loss of principal or income on the failure of an obligor or counterparty to meet their contractual obligations. As our primary business is commercial banking, the Group is exposed to credit risks from loans to retail, corporate, and institutional customers. Trading and investment banking activities, such as trading of derivatives, debt securities, foreign exchange, commodities, securities underwriting, and settlement of transactions, also expose the Group to counterparty and issuer credit risks.

The Group seeks to take only credit risks that meet our underwriting standards. We seek to ensure that risks are commensurate with potential returns that enhance shareholder value.

### **Credit Risk Management Oversight and Organisation**

The Credit Risk Management Committee is the senior management committee that supports the CEO and the Board Risk Management Committee in managing the Group's overall credit risk exposures, taking a proactive view of risks and to position the credit portfolio. The Credit Risk Management Committee also reviews the Group's credit risk philosophy, framework, and policies, and aligns credit risk management with business strategy and planning. The Credit Risk Management Committee recommends credit approval authority limits, reviews the credit profile of material portfolios, and recommends actions where necessary to ensure that credit risks remain within established risk tolerances.

Within Group Risk Management Division, Credit Risk Management ("CRM") departments have functional responsibility for credit risk management, including formulating and ensuring compliance with Group-wide risk policies, guidelines, and procedures. Other Group Risk departments are responsible for risk portfolio monitoring, risk measurement methodology, risk reporting, risk control systems, and remedial loan management. Group Risk units also conduct regular credit stress tests to assess the credit portfolio's vulnerability to adverse credit risk events.

Regular risk reporting is made to the Board of Directors, Board Risk Management Committee, and the Credit Risk Management Committee in a timely, objective, and transparent manner. These reports include various credit risk aspects such as portfolio quality, credit migration, expected losses, and concentration risk exposures by business portfolio and geography. Such reporting allows senior management to identify adverse credit trends, formulate and implement timely corrective action, and ensure appropriate risk-adjusted decision making.

### **Credit Risk Management Approach**

Our credit risk management framework includes comprehensive credit risk policies for approval and management of credit risk, as well as methodologies and models to quantify these risks in a consistent manner. While Group policies set our minimum credit risk management standards, the key to our success lies also in the experience and sound judgement of our credit officers and embedded regular credit review process. The internal audit review also provides an independent assessment of the effectiveness and adequacy of our credit risk management practices.

Credit underwriting criteria are regularly updated to reflect prevailing economic conditions in our key markets. In addition, we remain selective in purchasing debt securities. Portfolio reviews and stress tests are conducted regularly to identify any portfolio vulnerabilities. Fair dealing is an integral part of OCBC's core corporate values: credit extensions are only offered after a comprehensive assessment of the borrower's creditworthiness, as well as the suitability and appropriateness of the product offering.

### **Lending to Consumers and Small Businesses**

Credit risks for the consumer and small business sectors are managed on a portfolio basis. Such products include mortgages, credit cards, auto loans, commercial property loans, and business term loans. Loans are underwritten under product programmes that clearly define the target market, underwriting criteria, terms of lending, maximum exposure, credit origination guidelines, and verification processes to prevent fraud. The portfolios are closely monitored using MIS analytics. Scoring models are used in the credit decision process for some products to enable objective risk evaluations and consistent decisions, cost efficient processing, and behavioural score monitoring of expected portfolio performance.

### **Lending to Corporate and Institutional Customers**

Loans to corporate and institutional customers are individually underwritten and risk-rated. Credit officers identify and assess the credit risks of large corporate or institutional customers, or customer groups, taking into consideration their financial and business profiles, industry and economic factors, collateral, or other credit support. Credit extensions have to meet pre-defined target market and risk acceptance criteria. To ensure objectivity in credit extensions, co-grantor approvals – or joint approvals – are required from both the business unit as well as credit controllers from the credit risk function.

### **Lending to Private Banking Customers**

With the acquisition of Bank of Singapore, OCBC has taken a strategic step towards becoming a leading player in private banking and wealth management across Asia. The Bank of Singapore is now an integral part of OCBC, and credit extensions to our wealth management clients are subject to the same standards of comprehensive credit assessment, setting of limits, as well as continuous risk monitoring. Joint approvals from the business and risk units also ensure objectivity in credit extensions. Loan advance rates are dependent on the liquidity, volatility and diversification of the collateral portfolio. Credit exposures that are secured by marketable securities are subject to daily valuation and independent price verification.

### **Credit Risk from Investment or Trading Activities**

Counterparty credit risks from our trading, derivative, and debt securities activities are closely monitored and actively managed to protect against potential losses in replacing a contract if a counterparty defaults. Counterparty credit limits are established for each counterparty following an assessment of the counterparty's creditworthiness in accordance with internal policies, as well as the suitability and appropriateness of the product offering. Credit exposures are also controlled through independent monitoring and reporting of excesses and breaches against approved limits and risk mitigation thresholds.

The Group has limited exposure to asset-backed securities and collateralised debt obligations and is not active in securitisation activities.

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### Internal Credit Rating Models

Internal credit rating models are an integral part of OCBC Group's credit risk management, decision-making process, and regulatory capital calculations. These internal rating models and the parameters – probability of default ("PD"), loss given default ("LGD"), and exposure at default ("EAD") – are used in limit setting, credit approval, monitoring, reporting, remedial management, stress testing, and internal assessment of the adequacy of capital and provisions.

An internal ratings framework has been established to govern the development and validation of rating models and the application of these models. Approval for the models and annual validation tests rests with the Credit Risk Management Committee or Board Risk Management Committee, depending on the materiality of the portfolios. All models are subject to independent validation before implementation to ensure that all aspects of the model development process have been satisfied. The models are developed with active participation by credit experts from risk control and business units. In addition, they are subject to annual review or more frequent monitoring and independent validation to ensure that they are performing as expected, and that the assumptions used in model development remain appropriate. All rating models are also assessed against regulatory requirements to ensure that they are fit to be used for regulatory purposes.

The Group's internal risk grades are not explicitly mapped to external credit agency ratings. Nevertheless, our internal risk grades may correlate to external ratings in terms of the probability of default ranges as factors used to rate obligors would be similar; an obligor rated poorly by an external rating agency is likely to have a weaker internal risk rating.

### A-IRB for Major Retail Portfolios

For regulatory capital requirements, the Group has adopted the Advanced Internal Ratings-Based ("A-IRB") approach for major retail portfolios, including residential mortgages, credit cards, auto loans, as well as small business lending. Internal rating models, developed from internal data, are used to estimate PD, LGD, and EAD parameters for each of these portfolios. Application and behaviour scorecards are used as key inputs for several retail PD models. Product, collateral, and geographical characteristics are major factors used in the LGD and EAD models.

### F-IRB for Major Non-Retail Portfolios

The Group's major non-retail portfolios are on the Foundation Internal Ratings-Based ("F-IRB") approach for regulatory capital requirements. Under this approach, internal models are used to estimate the PD for each obligor, while LGD and EAD parameters are prescribed by MAS. These PD models are statistically based or expert judgement models that make use of quantitative and qualitative factors to assess an obligor's repayment capacity and are calibrated to expected long-term average one-year default rate over an economic cycle. Expert judgement models are typically used for portfolios where there are a low number of internal default observations. These models are developed with credit experts

who have in-depth experience with the specific portfolio being modelled. The models also comply with the regulatory criteria for parameterisation. For major specialised lending portfolios, risk grades derived from internal models are mapped to the five supervisory slotting categories as prescribed in MAS Notice 637. The risk weights prescribed for these slotting categories are used to determine the regulatory capital requirements for such exposures.

### IRB Approach for Securitisation Exposures

The credit risk weighted assets for securitisation exposures are computed using the ratings based method for such exposures as prescribed by MAS Notice 637.

### Standardised Approach for Other Portfolios

Other credit portfolios, such as private banking and exposures to sovereigns are under the standardised approach, and will be progressively migrated to the ratings-based approaches. Under this approach, regulatory prescribed risk weights based on asset class and external ratings from approved credit rating agencies, where available, are used to determine the risk weighted assets and regulatory capital. Approved external rating agencies include Standard & Poor's, Moody's, and Fitch.

### Credit Risk Control

#### Credit Risk Mitigation

Transactions are entered into primarily on the strength of a borrower's creditworthiness, ability to repay, and repayment sources. To mitigate credit risk, the Group accepts collateral as security, subject to Group policies on collateral eligibility. Types of collateral include cash and marketable securities; residential and commercial real estate; vessels, aircraft, and automobiles; and other tangible business assets, such as inventory and equipment.

The value of collateral is prudently assessed on a regular basis, and valuations are performed by independent appraisers. Discounts are applied to the market value of collateral, reflecting the quality, liquidity, volatility, and collateral type. The loan-to-value ratio is a key factor in the credit granting decision. OCBC Group also accepts guarantees from individuals, corporates, and institutions as a form of support.

To mitigate counterparty credit risk, financial collateral may be taken to partially or fully cover mark-to-market exposures on outstanding positions in accordance with internal policies on collateral eligibility. A discount is normally applied on the collateral to cover potential adverse market volatility and currency risk. The collateral agreement typically includes a minimum threshold amount where additional collateral is to be posted by either party if the mark-to-market exposures exceed the agreed threshold amount. Master agreements, such as those from International Swaps and Derivatives Agreement ("ISDA"), are also used and these allow for close out netting if either counterparty defaults. For derivative contracts, the total credit exposure of the contract is the mark-to-market value plus the estimate of the potential credit exposure over the remaining term of the contract. The Group calculates such exposures and uses statistical modelling tools to estimate the potential worst-case scenario.

Some netting and collateral agreements may contain rating triggers, although the thresholds in the majority of our agreements are identical in the event of a one-notch rating downgrade. Given the Group's investment grade rating, there is minimal increase in collateral required to be provided to our counterparties if there is a one-notch downgrade of our credit rating.

### Managing Credit Risk Concentrations

Credit risk concentrations exist in lending to single customer groups, borrowers engaged in similar activities, or diverse groups of borrowers that could be affected by similar economic or other factors. To manage these concentrations, exposure limits are established for single borrowing groups, counterparties, industry segments, countries, and cross-border transfer risks. Limits are aligned with the Group's business strategy and resources, and take into account the credit quality of the borrower, available collateral, regulatory requirements, and country risk ratings. Limits are typically set taking into consideration factors such as impact on earnings and capital as well as regulatory constraints.

While we are steadily diversifying our exposure internationally, and expanding in China, our credit risk concentrations remain significant in our traditional home markets of Singapore and Malaysia. In terms of industries, we have a significant exposure to the real estate market in Singapore. This is supported by dedicated specialist teams in origination as well as credit risk management. Particular attention is paid to borrower and collateral quality, project feasibility, and emerging market conditions. Regular stress tests are performed on the portfolio.

The Bank is in compliance with Section 35 of the Banking Act, which limits its exposure to real estate in Singapore to not more than 35% of its total eligible loan assets.

### Remedial Management

The Group has been able to anticipate areas of potential weakness at an early stage through the regular monitoring of the credit quality of our exposures, with an emphasis on a proactive and forward-looking approach to early problem recognition. We value long-term relationships with our customers by working closely with them at the onset of their difficulties. Applying specialist remedial management techniques even before the loan becomes non-performing allows us to maintain sound asset quality and promote customer loyalty and retention.

Loans are categorised as "Pass" or "Special Mention", while non-performing loans ("NPLs") are categorised as "Substandard", "Doubtful", or "Loss" in accordance with MAS Notice 612. These indicators allow us to have a consistent approach to early problem recognition and effective remedial management.

OCBC Group has established specialist and centralised units to manage problem exposures to ensure timely NPL reduction and maximise loan recoveries. Time, risk-based, and discounted cash flow approaches are deployed to optimise collection and

asset recovery returns, including monitoring set indicators like delinquency buckets, adverse status, and behavioural score trigger points for consumer NPLs. The Group uses a suite of collection information systems to constantly fine-tune and optimise its objectives of recovery, effectiveness, and customer retention.

### Impairment Allowances for Loans

The Group maintains allowances for loans that are sufficient to absorb credit losses inherent in its loan portfolio. Total loan loss reserves comprise specific allowances against each NPL and a portfolio allowance for all loans on books to cover any losses that are not yet evident. The Group's policy for loan allowances is guided by Financial Reporting Standard 39 ("FRS 39"), as modified by MAS Notice 612.

Specific allowance is established when the present value of future recoverable cash flows of the impaired loan is lower than the carrying value of the loan. Assessment for impairment is conducted on a loan-by-loan basis. The exceptions are homogenous loans (such as housing loans, consumer loans, and credit card receivables) below a certain materiality threshold, where such loans may be pooled together according to their risk characteristics and collectively assessed according to the degree of impairment, taking into account the historical loss experience on such loans.

Portfolio allowances are set aside based on management's credit experiences and judgement for estimated inherent losses that may exist but have not been identified to any specific financial asset. Credit experiences are based on historical loss rates that take into account geographic and industry factors. A minimum 1% portfolio allowance is set aside under the transitional arrangement in MAS Notice 612.

### Write-offs

Loans are written off against impairment allowances when recovery action has been instituted and the loss can be reasonably determined.

### Ceasing of Interest Accrual on Loans

When a loan is classified "Substandard", "Doubtful", or "Loss", interest income ceases to be recognised in the income statement on an accrual basis. However, this non-accrual of interest does not preclude the Group's entitlement to the interest income as it merely reflects the uncertainty in the collectability of such interest income.

### Collateral Held Against NPLs

Real estate in Singapore forms the main type of collateral for the Group's NPLs. The realisable value of the real estate collateral is used to determine the adequacy of the collateral coverage. Proceeds from the sale of collateral pledged for a particular loan cannot be applied to other classified loans unless the accounts are related and legal cross collateralisation of the facilities have been provided for.

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### MARKET RISK MANAGEMENT

Market risk is the risk of loss of income or market value due to fluctuations in market factors such as interest rates, foreign exchange rates, equity and commodity prices, or changes in volatility or correlations of such factors. OCBC Group is exposed to market risks from its trading and client servicing activities.

OCBC Group's market risk management strategy and market risk limits are established within the Group's risk appetite and business strategies, taking into account macroeconomic and market conditions. Market risk limits are subject to regular review.

#### Market Risk Management Oversight and Organisation

The Market Risk Management Committee is the senior management committee that supports the Board Risk Management Committee and the CEO in market risk oversight. The Market Risk Management Committee establishes market risk management objectives, framework, and policies governing prudent market risk taking, which are backed by risk methodologies, measurement systems, and internal controls.

The Market Risk Management Committee is supported at the working level by the Market Risk Management Department ("MRMD") of Group Risk Management Division. MRMD is the independent risk control unit responsible for operationalising the market risk management framework to support business growth while ensuring adequate risk control and oversight.

#### Market Risk Management Approach

Market risk management is a shared responsibility. Business units are responsible for undertaking proactive risk management along with their pursued trading strategies, while the MRMD acts as the independent monitoring unit that ensures sound governance practices. Key risk management activities of identification, measurement, monitoring, control, and reporting are regularly reviewed to ensure they are commensurate with the Group's market risk taking activities.

#### Market Risk Identification

Risk identification is addressed via the Group's new product approval process at product inception. Market risks are also identified by our risk managers who proactively interact with the business units on an ongoing basis.

### Market Risk Measurements

#### Value-At-Risk

Value-at-risk ("VaR") is a key market risk measure for the Group's trading activities. The Board Risk Management Committee agrees on an aggregate market risk appetite based on VaR. VaR is measured and monitored by its individual market risk components, namely interest rate risk, foreign exchange risk, equity risk and credit spread risk, as well as at the aggregate level. VaR is based on a historical simulation approach and is applied against a one-day holding period at a 99% confidence level. As VaR is a statistical measure based on historical market fluctuations, it might not accurately predict forward-looking market conditions all the time. As such, losses on a single trading day may exceed VaR, on average, once every 100 days.

#### Other Risk Measures

As the Group's main market risk is interest rate fluctuations, Present Value of a Basis Point ("PV01"), which measures the change in value of interest rate sensitive exposures resulting from one basis point increase across the entire yield curve, is an additional measure monitored on a daily basis. Other than VaR and PV01, the Group also utilises notional amounts, CS01 (1 Basis Point move in Credit Spreads) and derivative greeks for specific exposure types, where appropriate, to supplement its risk measurements.

#### Stress Testing and Scenario Analyses

The Group also performs stress testing and scenario analyses to better quantify and assess potential losses arising from low probability but plausible extreme market conditions. The stress scenarios are regularly reviewed and fine-tuned to ensure that they remain relevant to the Group's trading activities, risk profile, and prevailing and forecast economic conditions. These analyses determine if potential losses from such extreme market conditions are within the Group's risk tolerance and capital level.

The following table provides a summary of the Group's trading VaR profile by risk types as at 31 December 2011 and 31 December 2010.

## VaR By Risk Type – Trading Portfolio

| SGD Millions                          | 2011     |         |                   |                   | 2010     |         |                   |                   |
|---------------------------------------|----------|---------|-------------------|-------------------|----------|---------|-------------------|-------------------|
|                                       | Year End | Average | Minimum           | Maximum           | Year End | Average | Minimum           | Maximum           |
| Interest Rate Risk VaR                | 14.88    | 10.63   | 6.49              | 16.91             | 11.10    | 7.72    | 5.45              | 12.21             |
| Foreign Exchange Risk VaR             | 2.79     | 8.02    | 2.25              | 26.70             | 3.62     | 7.55    | 1.49              | 18.91             |
| Equity Risk VaR                       | 2.51     | 2.03    | 0.94              | 4.91              | 1.12     | 1.43    | 0.31              | 3.03              |
| Credit Spread Risk VaR                | 3.71     | 3.04    | 1.12              | 5.08              | 1.31     | 1.74    | 0.61              | 3.19              |
| Diversification Effect <sup>(1)</sup> | -3.98    | -9.70   | NM <sup>(2)</sup> | NM <sup>(2)</sup> | -8.95    | -8.37   | NM <sup>(2)</sup> | NM <sup>(2)</sup> |
| Aggregate VaR                         | 19.91    | 14.02   | 6.77              | 26.06             | 8.20     | 10.07   | 6.76              | 17.27             |

<sup>(1)</sup> Diversification effect is computed as the difference between Aggregate VaR and sum of asset class VaRs.

<sup>(2)</sup> Not meaningful as the minimum and maximum VaR may have occurred on different days for different asset classes.

### Risk Monitoring and Control

#### Limits

Only authorised trading activities may be undertaken by the various business units within the allocated limits. All trading risk positions are monitored on a daily basis against these limits by independent support units. Limits are approved for various business activity levels, with clearly defined exception escalation procedures. All exceptions are promptly reported to senior management for appropriate rectification. The imposition of limits on the multiple risks (VaR and risk sensitivities), profit/loss, and other measures allow for more holistic analysis and management of market risk exposures.

#### Model and Valuation Control

Model and valuation control is also an integral part of the Group's risk control process. Valuation and risk models are deployed

in the Group for pricing of financial instruments and VaR calculation, respectively. The Group ensures the models used are fit for their intended purpose, through verifying the parameters, assumptions, and robustness associated with each model before it is implemented for use. Market rates used for risk measurements and valuation by the Market Risk Management Department are sourced independently, thereby adding to the integrity of the trading profits and losses ("P&L"), risk measures and limit control.

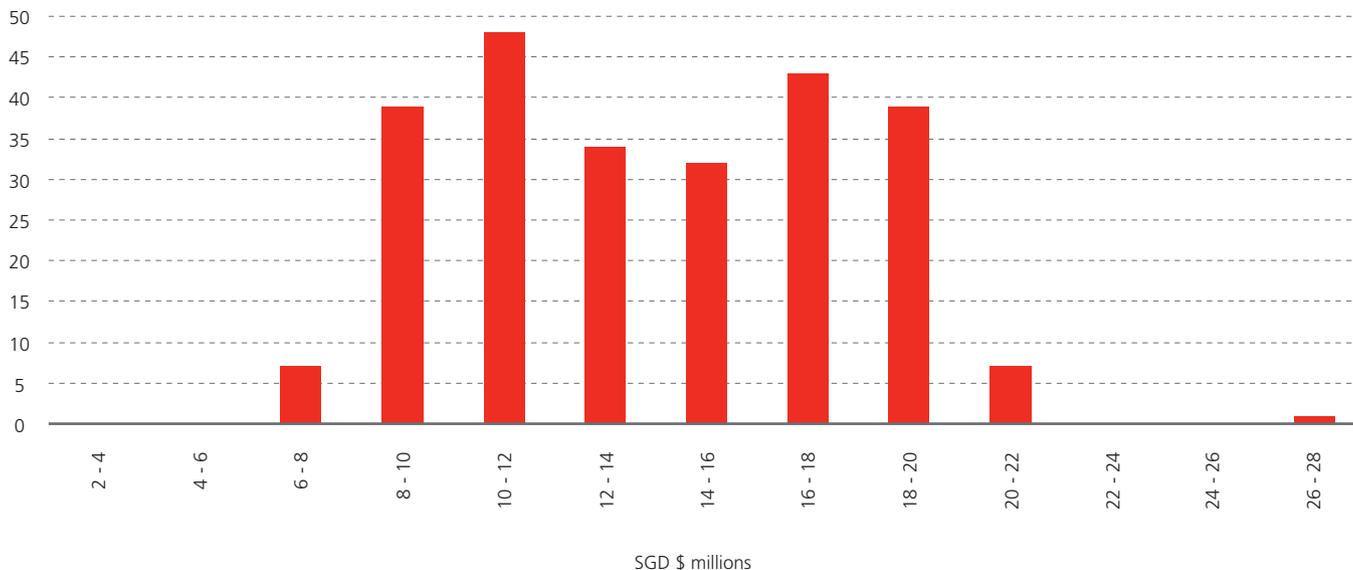
Valuation reserves and other operational controls are also imposed to strengthen overall general and model risk management. To ensure the continued integrity of the VaR model, the Group conducts back-testing to confirm the consistency of actual daily trading P&L, as well as theoretical P&L against the model's statistical assumptions.

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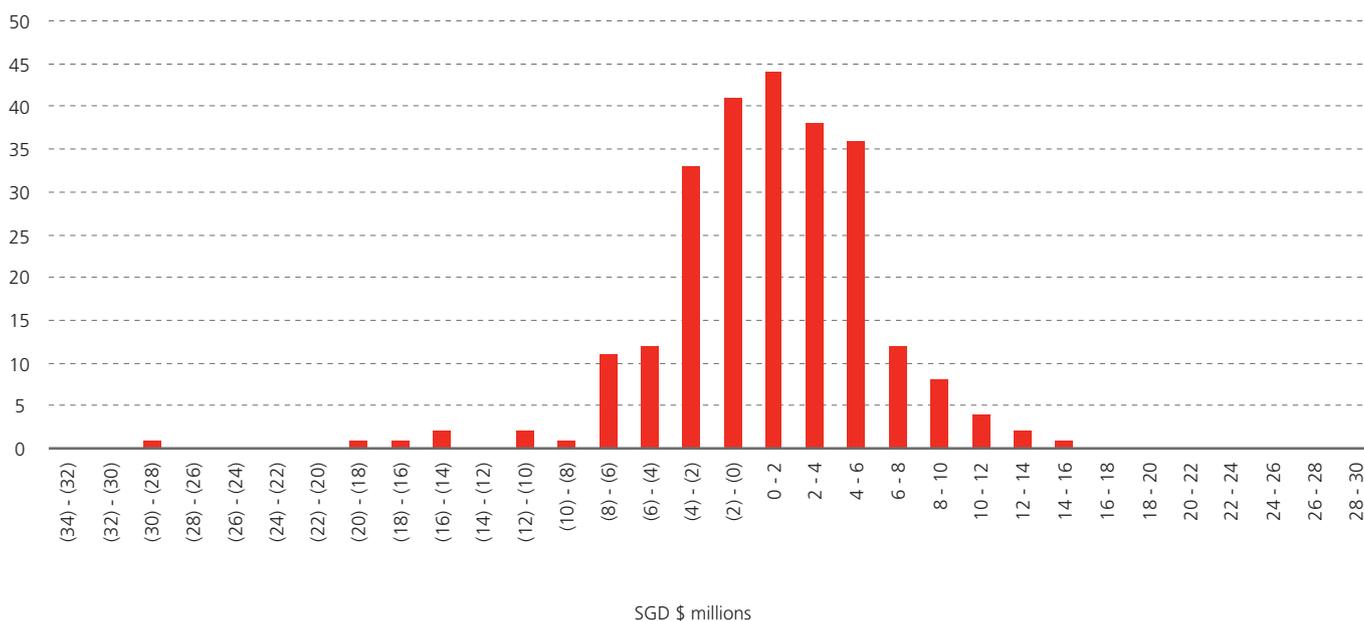
### Frequency Distribution of Group Trading Book Daily Aggregate VaR (One Day Holding Period) for FY 2011

Number of Trading Days



### Frequency Distribution of Group Trading Book Daily Revenue for FY 2011

Number of Trading Days



## ASSET LIABILITY MANAGEMENT

Asset liability management is the strategic management of the balance sheet structure and liquidity needs, covering funding liquidity risk management, structural interest rate management and structural foreign exchange management.

### Asset Liability Management Oversight and Organisation

The Asset Liability Management Committee (“ALCO”) is responsible for the oversight of our Group liquidity and balance sheet risks. The ALCO is chaired by the CEO and includes senior management from the business, risk and support units. The ALCO is supported by the Asset Liability Management Department within the Group Risk Management Division.

### Asset Liability Management Approach

The Asset Liability Management framework comprises liquidity risk management, structural interest rate risk management and structural foreign exchange risk management.

### Liquidity Risk

The objective of liquidity risk management is to ensure that there are sufficient funds to meet contractual and regulatory financial obligations as well as to undertake new transactions.

Our liquidity management process involves establishing liquidity management policies and limits, regular monitoring against liquidity risk limits, regular stress testing, and establishing contingency funding plans. These processes are subject to regular reviews to ensure that they remain relevant in the context of prevailing market conditions.

Liquidity monitoring is performed daily within a framework for projecting cash flows on a contractual and behavioural basis. Simulations of liquidity exposures under stressed market scenarios are performed and the results are taken into account in the risk management processes. Structural liquidity indicators such as liquidity and deposit concentration ratios are employed to maintain an optimal funding mix and asset composition. Funding strategies are in place to provide effective diversification and stability in funding sources across tenors, product and geography. In addition, we maintain a level of liquid assets exceeding the regulatory requirement for use in the event of a liquidity crisis. These assets comprise statutory reserve eligible securities as well as marketable shares and debt securities.

### Structural Interest Rate Risk

The primary goal of interest rate risk management is to ensure that interest rate risk exposures are maintained within defined risk tolerances.

Interest rate risk is the risk to earnings and capital arising from exposure to adverse movements in interest rates. The material sources of interest rate risk are repricing risk, yield curve risk, basis risk and optionality risk. A range of techniques are employed to measure these risks from an earnings and economic value perspective. One method involves the simulation of the impact of a variety of interest rate scenarios on the net interest income as well as the economic value of the Group’s equity. Other measures include interest rate sensitivity measures such as PV01 as well as repricing gap profile analysis.

Limits and policies to manage interest rate exposures are established in line with the Group’s strategy and risk appetite, appropriately approved, and reviewed regularly to ensure they remain relevant to the external environment. Control systems are established to monitor the profile against the approved risk thresholds.

### Structural Foreign Exchange Risk

Structural foreign exchange exposure arises primarily from net investment in overseas branches, subsidiaries, strategic investments, as well as property assets. The objective is to protect the capital and financial soundness by identifying, measuring, and managing the potential adverse impact of structural foreign exchange risk exposures. OCBC actively manages this risk through hedges and funding investments in foreign currencies, in order to minimise potential adverse impact.

## OPERATIONAL RISK MANAGEMENT

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, systems and management, or from external events. Operational risk includes legal risk and reputation risk.

The Group’s operational risk management aims to minimise unexpected and catastrophic losses and to manage expected losses. This enables new business opportunities to be pursued in a risk-conscious and controlled manner.

### Operational Risk Management Oversight and Organisation

The Operational Risk Management and Information Security Committee (“ORISC”) is the senior management committee that oversees the execution of the Group’s Operational Risk Management, Information Security and Technology Risk practices, and ensures that the respective risk management programmes are appropriate, effective, and support the Group’s business strategy. ORISC also has oversight over the management of the Group’s fiduciary, reputational and legal risks.

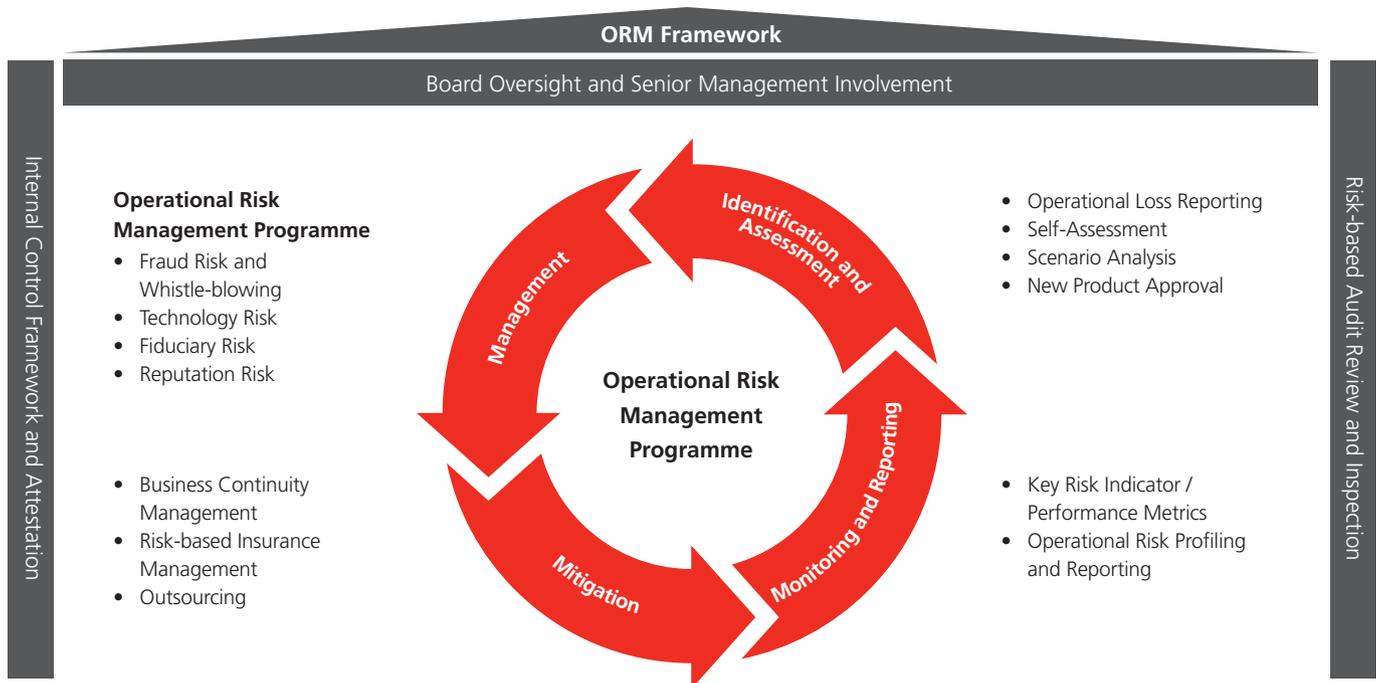
The Operational Risk Management (“ORM”) Department of Group Risk Management Division establishes the ORM framework, including policies and methodologies. The ORM department also provides independent oversight of operational risk monitoring and control. The ORM programmes are actively implemented through the respective operational risk co-ordinators or managers in the business units.

### Operational Risk Management Approach

The Group manages operational risks through a framework that ensures operational risks are properly identified, managed, monitored, mitigated, and reported in a structured and consistent manner. The framework is underpinned by an internal control system that reinforces the Group’s control culture by establishing clear roles and responsibilities for staff and preserving their rights in executing their control functions without fear of intimidation or reprisal. The Group recognises the importance of establishing a risk-awareness culture in the managing of operational risk through embedding risk management in the Group’s core processes.

# Risk Management

(This section forms an integral part of OCBC’s audited financial statements)



Each business unit undertakes regular self-assessment of the risk and control environment to identify, assess, and measure its operational risks, which include regulatory and legal risks. Risk metrics are also used to detect early warning signals and drive appropriate management actions before risks materialise into material losses.

Senior management also attests annually to the CEO and Board Risk Management Committee on the effectiveness of the internal control system, as well as report key control deficiencies and appropriate remedial plans. Operational risk losses and incidents are used as information for reporting and for providing risk profiling information to senior management and the Board Risk Management Committee.

For information security, the Group protects and ensures the confidentiality, integrity, and availability of its information assets through implementing appropriate security controls to protect against the misuse or compromise of information assets. New and appropriate security technologies are regularly identified and implemented as part of the Group’s technology risk management strategy to mitigate any possible threats to the Group’s information technology environment.

To mitigate the impact of unforeseen operational risk events, Group management has implemented business continuity management and crisis management programmes to ensure the uninterrupted availability of all business resources to support essential business activities. On an annual basis, Senior Management provides an attestation to the Board Risk Management Committee on the state of business continuity management including the internally developed business continuity management maturity scorecard, extent of alignment to MAS guidelines and declaration of residual risk. The Group also monitors the health and security environment of the locations of the Group’s key operations to assess possible threats that may adversely affect the Group and its employees.

The Group’s Fraud Risk Management (“FRM”) and whistle-blowing programmes help prevent and detect fraud or misconduct, as well as enable rapid and co-ordinated incident responses, including establishing the cause, remedial actions, and damage control procedures. The Group is proactively strengthening its FRM infrastructure to manage emerging threats through new programmes and initiatives.

### Reputation Risk Management

Reputation risk is the current or prospective risk to earnings and capital arising from adverse perception of the image of the Group on the part of customers, counterparties, shareholders, investors and regulators. The Group has a reputation risk management programme to manage any such potential current, or future adverse impact on earnings and continued access to sources of funding. The programme focuses on understanding and managing our responsibilities toward our different stakeholders, and protecting our reputation. A key emphasis of the programme is effective information sharing and engagement with stakeholders.

### Fiduciary Risk Management

The Group has a fiduciary risk management programme to manage risks associated with fiduciary relationships created in managing funds or providing other services. The programme provides guidelines on regular identification, assessment, mitigation, and monitoring of fiduciary risk exposures, to ensure the Group’s compliance with applicable corporate standards.

### Regulatory and Legal Risks

Each business unit is responsible for the adequacy and effectiveness of controls in managing both regulatory and legal risks. An annual Regulatory Compliance Certification is provided by senior management to the CEO and Board Risk Management Committee on the state of regulatory compliance.