2014 Risk Report
Macquarie Group

The following is an extract from the Macquarie Group Limited 2014 Annual Financial Report
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Introduction – Macquarie’s risk management framework
The acceptance of risk is an integral part of Macquarie’s businesses. Management of that risk is, therefore, critical to Macquarie’s continuing profitability. Strong independent prudential management has been a key to Macquarie’s success and stability over many years. Where risk is assumed it is within a calculated and controlled framework that assigns clear risk roles and responsibilities represented by ‘three lines of defence’.

The primary responsibility for risk management lies at the business level, which forms the first line of defence. Part of the role of all business managers throughout the Macquarie business units is to ensure risks are managed appropriately. The risk management function forms the second line of defence and independently assesses all material risks. The third line, which includes internal audit, independently reviews and challenges the group’s risk management controls, processes and systems.

Macquarie’s core risk management principles have remained stable and continue to be highly effective. These are:

Ownership of risk at the business level – Operating Group Heads are responsible for identifying risks within their businesses and ensuring that they are managed appropriately. Before taking decisions, clear analysis of the risks is sought to ensure risks taken are consistent with the risk appetite and strategy of Macquarie. Business ownership of risk is an essential element in understanding and controlling risk.

Understanding worst case outcomes – Macquarie’s risk management approach is based on examining the consequences of worst case outcomes and determining whether these are acceptable. This approach is adopted for all material risk types and is often achieved by stress testing. In particular, Macquarie’s market risk framework is based primarily on the application of stress tests, rather than statistical models. The effectiveness of this approach was demonstrated over the recent past. Shocks observed in the markets generally remained within Macquarie’s stress scenarios, resulting in very few of our worst case loss scenarios being exceeded. While Macquarie operates a number of sophisticated quantitative risk management processes, the foundation of its risk management approach is the informed consideration of both quantitative and qualitative inputs by highly experienced professionals.

Requirement for an independent signoff by risk management – Macquarie places significant importance on having a strong independent Risk Management Group (RMG) that is charged with signing off all material risk acceptance decisions. It is essential RMG has the capability to do this effectively and hence RMG has invested in recruiting skilled professionals, many with previous trading or investment banking experience. For all material proposals, RMG’s opinion is sought at an early stage in the decision making process and independent input from RMG on risk and return is included in the approval document submitted to senior management.

Risk appetite setting
Risk appetite is the nature and amount of risk that the Group is willing to accept. At Macquarie, this is expressed through the Board-approved risk appetite statement, aggregate and specific risk limits, relevant policies, and requirement to consider risk adjusted returns.

The Board reviews and endorses Macquarie’s risk appetite as part of the annual corporate strategy review process.

1 Risk Appetite Statement
Macquarie’s risk appetite statement is approved by the Board and sets out the degree of risk Macquarie is willing to take overall and for each material risk type. It also conveys the process for ensuring that risk limits (tolerances) are set at an appropriate level, monitored and reviewed. Macquarie determines its overall appetite for risk with reference to earnings and not just capital. Aggregate risk is expressed by setting a Global Risk Limit designed to ensure that in a prolonged and severe downturn, losses would be covered by earnings and surplus capital, and market confidence in Macquarie is maintained.

2 Limits
These consist of specific risk limits given to various businesses and products or industry sectors as well as the Global Risk Limit that constrains Macquarie’s aggregate level of risk.

In accordance with Macquarie’s ‘no limits, no dealing’ approach, individual credit and equity exposures must also fit within approved counterparty limits. Market risk exposures are governed by a suite of individual and portfolio limits.

3 Relevant policies
There are numerous Macquarie-wide policies that set out the principles that govern the acceptance and management of risks. A key policy is the New Product and Business Approval Policy, which is designed so that the proposed transaction or operation can be managed properly and does not create unknown or unwanted risks for Macquarie in the future.

4 Requirement to consider risk-adjusted returns
At Macquarie, proposals for all significant new deals, products and businesses must contain an analysis of risk-adjusted returns.

Risk capacity is allocated to activities that earn an appropriate reward for the risk. This is a binding discipline on risk acceptance to ensure the risk-return trade-off does not deteriorate. The level of acceptable return for any proposal must also account for strategic fit and broader risk analysis (for example tail risk and concentration).

Existing businesses are subject to regular risk-return monitoring and reporting. Risk-adjusted performance metrics for each division are a significant input into performance based remuneration.
Macquarie’s risk culture is well established

Macquarie recognises that an effective risk management framework involves more than just robust controls. Macquarie’s risk culture, which is less tangible, is equally as important and at Macquarie the risk culture remains strong and controls are respected by staff. Risk culture is established and maintained in the organisation broadly through three steps:

- **Setting expectations** - The Board sets expectations regarding appropriate behaviours and oversees performance.
- **Leading and executing** - Management implement these expectations by their leadership actions and communication, organisational governance, incentives and consequences as well as establishing appropriate capability.
- **Monitoring and measuring** - Effectiveness is assessed and reported to allow adjustment and refinement as necessary.

Key aspects supporting Macquarie’s risk culture include:

- **Macquarie’s businesses are fundamentally client based**, Therefore, across Macquarie, greater emphasis is placed on fostering long-term relationships with our clients and building franchise businesses as opposed to short-term profits from proprietary trading
- **Consideration of worst-case scenarios is part of everyday risk controls rather than supplementary to them**, Even though the worst case scenarios are often in excess of what has been historically observed, they play a major role in influencing and limiting positions particularly for extreme loss events. For example, we apply limits to contingent losses from an instantaneous 40 per cent gap move in stock prices. This effectively constrains trading divisions from issuing well out of the money options and encourages hedging of extreme loss events. We have over 14,000 contingent loss limits that consider a variety of worst case scenarios
- **The role of risk management staff is one of active engagement in risk-taking decisions**, In accordance with the principle of risk ownership, the primary risk analysis and initial decisions to reject or accept a transaction are taken by Operating Groups. In its review of a new proposal, RMG provides an independent confirmation of the risk acceptance decision. RMG works closely with the deal team and shares the goal of making the transaction successful by requiring improvements to the transaction terms where applicable. Strong emphasis is placed on transferring knowledge to transaction teams so that the same risk management principles are applied to future proposals from an early stage
- **Macquarie’s remuneration policy for senior management encourages a long-term view in decision making**, It discourages excessive risk taking as incentives are aligned with the long-term profitability of the firm through retention of remuneration and equity participation. The principles behind our current remuneration structure have been in place for many years.

**Risk governance structure**

Risk management is sponsored by the Macquarie Group Board (Board), and is a top priority for senior managers, starting with the Managing Director and CEO (CEO).

The Head of RMG, as Macquarie’s Chief Risk Officer (CRO), is a member of Macquarie’s Executive Committee and reports directly to the CEO. The CRO has a secondary reporting line to the Board Risk Committee that approves the replacement, appointment, reassignment or dismissal of the CRO.

The Board oversees the risk appetite and profile of Macquarie and ensures that business developments are consistent with the risk appetite and goals of Macquarie.

All Board members are members of the Board Risk Committee. The Board Risk Committee reviews and endorses Macquarie’s risk management framework which includes the establishment of policies for the control of risk. The Board Risk Committee receives information on the risk profile of Macquarie, breaches of the policy framework and external developments that may have some impact on the effectiveness of the risk management framework. It also approves significant changes to risk management policies and framework and approves Macquarie’s risk appetite. The Board Risk Committee is assisted by the following Committees:

- The Board Audit Committee (BAC) monitors the effectiveness of internal controls with Macquarie’s management, the Head of Internal Audit and the external auditor. The BAC also monitors and reviews the effectiveness of the external auditors and the Internal Audit and Credit Assurance functions
- The Board Remuneration Committee liaises with the Board Risk Committee and the CRO to ensure there is a properly integrated approach to remuneration that appropriately reflects risk
- The Board Governance and Compliance Committee (BGCC) reviews Macquarie’s corporate governance arrangements and compliance matters. The BGCC also has oversight of Work Health and Safety and environmental matters on behalf of the Board.

Committees exist at the executive management level to ensure that the necessary elements of expertise are focused on specific risk areas. The Macquarie and Macquarie Bank Executive Committees and the Macquarie Operations Review Committee focus on strategic issues, operational issues, material transactions and the management of risk and review the performance of Macquarie on a monthly basis. Beneath this level, there are other committees where senior specialists focus on specific risks as appropriate. The Market Risk Committee and Asset and Liability Committee are examples of these committees.

While committees oversee Macquarie’s risk appetite and acceptance process, risk acceptance decisions are ultimately delegated to individuals to ensure that approvers are individually accountable when signing off on risk acceptance decisions.
**Risk Management Group**

RMG’s oversight of risk is based on the following five principles:

**Independence**

RMG, which is responsible for assessing and monitoring risks across Macquarie, is independent of the operating areas of Macquarie, and the Head of RMG, as Macquarie’s CRO, reports directly to the CEO with a secondary reporting line to the Board Risk Committee. RMG approval is required for all material risk acceptance decisions.

**Centralised prudential management**

RMG’s responsibility covers the whole of Macquarie. Therefore, it can assess risks from a Macquarie-wide perspective and provide a consistent approach across all operating areas.

**Approval of all new business activities**

Operating areas cannot undertake new businesses or activities, offer new products, or enter new markets without first consulting RMG. RMG reviews and assesses risk and sets prudential limits. Where appropriate, these limits are approved by the Executive Committee and the Board.

**Continuous assessment**

RMG continually reviews risks to account for changes in market circumstances and developments within Macquarie’s operating areas.

**Frequent monitoring**

Centralised systems exist to allow RMG to monitor credit and market risks daily. RMG staff liaise closely with operating and support divisions.

**RMG structure and resourcing**

Effective risk management is not only a function of disciplined processes but also of imaginative analysis by talented individuals. RMG attracts high calibre candidates. It recruits experienced individuals both from within Macquarie and externally and is a source of talent for Macquarie’s Operating Groups when recruiting.

While RMG is structured into specialist teams as detailed below, we employ an integrated approach to risk analysis and management across risk classes. RMG’s assessment and monitoring of risks involves a collaborative effort across the teams to ensure that a detailed analysis takes place both at the individual and aggregate risk level.

*Financial Crimes Compliance includes Anti-money laundering, Anti-bribery & Corruption and Sanctions*
The change in staffing levels within RMG is generally in line with the changes in staffing overall at Macquarie. RMG staff numbers as at 31 March 2014 were 553, which is a ten per cent increase over the year.

New business and acquisitions

Innovation is encouraged across Macquarie’s businesses and activities. Therefore, it is important that all elements of new business initiatives are well understood before commencement.

All new business initiatives must be signed off by RMG prior to commencement.

The formal new business approval process requires all relevant risks (for example, market, credit, equity, legal, compliance, taxation, accounting, operational and system) to be reviewed to ensure that all risks are identified and addressed prior to implementation (including ongoing risk monitoring processes). The approvals of RMG, Finance Division, Taxation Division, Legal and Governance and other relevant stakeholders within Macquarie are obtained. RMG also checks that all necessary internal approvals are obtained prior to commencement.

For all material transactions, independent input from RMG on the risk and return of the transaction is included in the approval document submitted to senior management.

The Operational Risk function within RMG oversees the new product and business approval process.

RMG Internal Audit performs an audit of the operations of any significant new businesses based on an assessment of the associated risk faced by Macquarie. The audit typically takes place within six to twelve months following acquisition or launch and includes confirmation that operations are in line with the new product approval document.

Risk management and monitoring

The risk management framework incorporates active management and monitoring of market, credit, equity, liquidity, operational, compliance, regulatory and legal risks. It is designed to ensure policies and procedures are in place to manage the risks arising within each division. Application varies in detail from one part of Macquarie to another; however, the same risk management framework applies across all business activities.

Credit risk

Credit Risk is defined as the risk of a counterparty failing to complete its contractual obligations when they fall due. The consequent loss is either the amount of the loan not paid back or the loss incurred in replicating a trading contract with a new counterparty.

The RMG Credit team maintains a comprehensive and robust framework for the identification, analysis and monitoring of credit risks arising within each business. Key aspects of this framework are discussed below.

Analysis and approval of exposures

The Macquarie and Macquarie Bank Boards are responsible for establishing the framework for approving credit exposures. The Boards delegate discretions to approve credit exposure to designated individuals within Macquarie whose capacity to exercise authority prudently has been assessed.
Operating Groups are assigned modest levels of credit discretions. Credit exposures above these levels are assessed independently by RMG and approved by senior RMG staff, the CEO and the Boards as required.

Macquarie enforces a strict ‘no limit, no dealing’ rule; all proposed transactions are analysed and approved by designated individuals before they can proceed.

All wholesale credit exposures are reviewed at least once a year, or more frequently if required. Retail credit exposures are monitored on a portfolio basis.

Independent analysis
The RMG Credit team provides independent analysis of credit risk exposures. The team works closely with the Operating Groups to identify the risks inherent in Macquarie’s businesses, and apply analysis commensurate to the level and nature of risks.

Credit risk analysis is focused on ensuring that risks have been fully identified and that the downside risk is properly understood and acceptable so that a balanced assessment can be made of the worst case outcome against the expected rewards. Downside analysis includes stress testing and scenario analysis.

Macquarie does not rely on quantitative models to assess credit risk in our wholesale portfolio, but uses fundamental credit analysis to make credit risk acceptance decisions.

Macquarie Group ratings
Macquarie has established a proprietary internal credit rating framework to assess counterparty credit risk. Macquarie ratings are used to estimate the likelihood of the counterparty defaulting on financial obligations. The Macquarie ratings system ensures a consistent assessment of borrower and transaction characteristics across Macquarie and provides the mechanism for meaningful differentiation of credit risk.

Each Macquarie rating maps to a Probability of Default estimate. All wholesale counterparties and certain individual facilities are assigned a Loss Given Default estimate reflecting the estimated economic loss in the event of default occurring.

All wholesale exposures are allocated a Macquarie rating on a scale that broadly corresponds to Standard & Poor’s and Moody’s Investor Services credit ratings. Credit Assurance, located within RMG, independently verifies the effectiveness of Macquarie’s credit risk management.

Measuring and monitoring exposures
Credit exposures for loans are evaluated as either the full current face value or where appropriate the acquisition cost when acquired in the secondary market.

Credit exposures for derivatives are a function of potential market movements. Portfolio credit exposure is determined using a high-confidence-level portfolio revaluation on the assumption of Macquarie having to go to the market to replace defaulting deals at the worst possible time during the active life of the portfolio. The RMG Credit Analytics team proposes and regularly reviews the market risk factor evolution models that are used in generating the possible market moves. The models are back-tested to ensure that they would have provided the required confidence level over a representative historical period. Evolution model and portfolio credit exposure reviews are conducted using a combination of fundamental and technical analysis and adjustments are made for market liquidity, risks associated with physical delivery and other significant risks.

Where trading gives rise to settlement risk, this exposure is assessed as the full face value of the settlement amount.

All credit exposures are monitored regularly against limits. To mitigate credit risk, Macquarie makes use of marging and other forms of collateral or credit enhancement techniques (including guarantees and letters of credit, the purchase of credit default swaps and mortgage insurance) where appropriate.

A review of the credit portfolio that involves monitoring credit concentrations by counterparty, country, risk type, industry and credit quality is carried out and reported to Macquarie’s Operations Review Committee quarterly and Board semi-annually. Policies are in place to manage credit risk and avoid unacceptable concentrations to any counterparty or country.
Loan impairment review

All exposures are subject to recurring review and assessment for possible impairment. Provisions for loan losses are based on an incurred loss model that recognises a provision where there is objective evidence of impairment at each balance date, and is calculated based on the discounted values of expected future cash flows.

Specific provisions are recognised where specific impairment is identified. The rest of the loans are placed into pools of assets with similar risk profiles and collectively assessed for losses that have been incurred but not yet identified.

Impaired assets continue to decline from the past year, driven by a combination of write-backs, write-downs and foreign currency movements.

Ratio of provisions and impaired assets to loans, advances and leases

Collective provision to loans, advances and leases (Balance sheet)
Net impaired assets to loans, advances and leases (Balance sheet)
Net credit losses to loans, advances and leases (Income statement)

Notes:
— Loan assets exclude securitised mortgages, securitised Macquarie Capital loans/leases, segregated future funds and receivables in the form of fees.
— Net impaired assets and net losses exclude investment securities.
— Collective provision (as per Note 11 of the Financial Report) is intended to cover losses inherent in the existing overall credit portfolio that are not yet specifically identifiable.
— Net credit losses represent total profit and loss impact in the stated period due to additional specific provisions and direct write-offs net of any write-backs.
— Please refer to Note 12 of the Financial Report for further information on impaired assets.
Country risk

Country risk is defined as losses arising from events in a country that include an act of government, war, terrorism, civil strife or economic crisis.

The Country Risk Policy guides the management of Macquarie’s country risk. Countries are grouped into categories based on the country’s risk profile. Before any exposure is taken in a country that is considered to be high-risk, a review of the economic, political and operating environment is undertaken to determine the level of exposure that is considered to be acceptable. Where appropriate, measures to mitigate country risk are put in place.

Market risk

Market risk is the exposure to adverse changes in the value of Macquarie’s trading portfolios as a result of changes in market prices or volatility. Macquarie is exposed to the following risks in each of the major markets in which it trades:

- foreign exchange and bullion – changes in spot and forward exchange rates and bullion prices and the volatility of exchange rates and bullion prices
- interest rates and debt securities – changes in the level, shape and volatility of yield curves, the basis between different debt securities and derivatives and credit margins
- equities – changes in the price and volatility of individual equities, equity baskets and equity indices, including the risks arising from equity underwriting activity
- commodities and energy – changes in the price and volatility of base metals, agricultural commodities and energy products.

Macquarie is also exposed to the correlation of market prices and rates within and across markets.

Macquarie has long favoured transparent scenario analysis over complex statistical modelling as the cornerstone of risk measurement.

Trading market risk

All trading activities contain calculated elements of risk taking. Macquarie is prepared to accept such risks provided they are within agreed limits, independently and correctly identified, calculated and monitored by RMG, and reported to senior management on a regular basis.

RMG monitors positions within Macquarie according to a limit structure that sets limits for all exposures in all markets. Limits are applied at a granular level to individual trading desks, through increasing levels of aggregation to divisions and Operating Groups, and ultimately, Macquarie. This approach removes the need for future correlations or scenarios to be precisely predicted as all risks are stressed beyond the 99 per cent level of confidence. For this reason, stress testing remains the predominant focus of RMG as it is considered to be the most effective mechanism to reduce Macquarie’s exposure to unexpected market events.

Macro-Economic-Linkages

MEL calculates Macquarie’s total market risk exposure to global market stress test scenarios extrapolated from historical crisis events and global market correlations. Each stress test scenario includes a primary shock to either equity or energy markets as well as cross-market effects in corporate margins, metals, foreign exchange, interest rates and commodities. MEL is Macquarie’s preferred internal measure of aggregate market risk because of the severity of the shocks applied and the ability for scenarios to develop with changing market dynamics. MEL is monitored and reported to senior management daily and to the Board regularly. It is reviewed by RMG regularly to ensure the measure remains appropriate for changing market conditions and the risks to which Macquarie is exposed.

The ‘Market Contagion’ scenario, typically the most conservative of the MEL stress test scenarios, accounts for all the significant markets to which Macquarie is exposed.

The assumptions in this scenario are considerably more severe than the conditions that prevailed throughout the Global Financial Crisis. The ‘Market Contagion’ scenario measures the impact of an instantaneous equity market crash of 15 to 30 per cent as well as additional shocks to foreign exchange, metals, interest rate, energy, agricultural commodity and credit markets. Macquarie’s exposure to the ‘Market Contagion’ stress test scenario increased slightly compared to last year as trading businesses managed exposures whilst looking to take advantage of recovering markets. The average exposure to the MEL stress test scenario represents less than five per cent of total equity.
Value-at-Risk

VaR provides a statistically based summary of overall market risk in Macquarie. The magnitude of VaR reflects changes in positions as well as changes in market volatility and correlations and enhancements to the model. The integrity of the VaR model is tested regularly against daily profit and loss.

The VaR model uses a Monte Carlo simulation to generate normally distributed price and volatility paths for approximately 2,800 benchmarks, using volatilities and correlations based on three years of historical data. Emphasis is placed on more recent market movements to more accurately reflect current conditions. Each benchmark represents an asset at a specific maturity, for example one year crude oil futures or spot gold. The benchmarks provide a high level of granularity in assessing risk, covering a range of points on yield curves and forward price curves, and distinguishing between similar but distinct assets; for example crude oil as opposed to heating oil, or gas traded in different locations. Exposures to individual equities within a national market are captured by specific risk modelling incorporated directly into the VaR model.

Macquarie’s market risk, as measured by VaR, peaked in July 2013 driven by higher benchmark volatilities (reflecting general market volatility in June) and larger commodity exposures. VaR subsequently reduced to levels in line with previous years. VaR remains modest in comparison to capital and earnings and continues to represent less than 0.2 per cent of total equity. The graph below shows the daily VaR and the six month average VaR as a percentage of total equity.

Aggregate VaR

<table>
<thead>
<tr>
<th>$A million</th>
<th>%</th>
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<tbody>
<tr>
<td>40</td>
<td>1.4%</td>
</tr>
<tr>
<td>35</td>
<td>1.2%</td>
</tr>
<tr>
<td>30</td>
<td>1.0%</td>
</tr>
<tr>
<td>25</td>
<td>0.8%</td>
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<tr>
<td>20</td>
<td>0.6%</td>
</tr>
<tr>
<td>15</td>
<td>0.4%</td>
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<tr>
<td>10</td>
<td>0.2%</td>
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VaR figures for year ended 31 March 2014 (1-day, 99% confidence level)

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<tr>
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<tbody>
<tr>
<td>Equities</td>
<td>5.55</td>
<td>8.21</td>
<td>2.98</td>
<td>4.26</td>
<td>6.64</td>
<td>2.78</td>
</tr>
<tr>
<td>Interest rates</td>
<td>10.37</td>
<td>15.56</td>
<td>6.17</td>
<td>10.45</td>
<td>14.19</td>
<td>8.19</td>
</tr>
<tr>
<td>Foreign exchange and bullion</td>
<td>3.97</td>
<td>8.05</td>
<td>1.05</td>
<td>2.58</td>
<td>7.00</td>
<td>0.42</td>
</tr>
<tr>
<td>Commodities and energy</td>
<td>13.08</td>
<td>20.89</td>
<td>7.36</td>
<td>10.02</td>
<td>16.95</td>
<td>6.35</td>
</tr>
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</table>
The effectiveness of Macquarie’s risk management methodology can be measured by Macquarie’s daily trading results. In light of uncertain market conditions, the small quantity and magnitude of daily losses incurred by Macquarie are indicative of both an effective risk management framework and business operations focused on servicing client needs.

Macquarie’s market risk activities continue to be based on earning income from spreads, franchise businesses and client flows. The majority of trading income is derived from client franchise activities rather than outright proprietary trading activity.

Macquarie’s trading approach has shown consistent profits and low volatility in trading results over time. This is evident in the graph below, and reflects the client-based nature of trading activities. In FY2014 Macquarie made a net trading profit on 220 out of the 261 trading days (2013 results: 221 out of 260 trading days).

Macquarie also has exposure to non-traded interest rate risk, generated by banking products such as loans and deposits. Interest rate exposures, where possible, are transferred into the trading books of FICC and Group Treasury and managed under market risk limits. However, some residual interest rate risks remain in the banking book due to factors outside the interest rate market or due to timing differences in accumulating exposures large enough to hedge. These residual risks in the banking book are monitored and controlled by RMG and reported to senior management regularly.

**Trading revenue**

**Non-traded market risk**
Risk Management Report

Equity risk
Equity risk is the risk of loss arising from banking book equity-type exposures. These exposures include:
- holdings in specialised funds managed by Macquarie
- principal exposures taken by Macquarie Capital, including direct investments in entities external to Macquarie
- property equity, including property trusts and direct property investments
- lease residuals
- other equity, including investments in resource companies.

Equity Risk Limit
All of the above equity risk positions are subject to an aggregate Equity Risk Limit (ERL). The ERL is set by the Board with reference to the Risk Appetite Test that is described further in the economic capital section. In setting the limit, consideration is also given to the level of earnings, capital and market conditions. The limit is reviewed on a semi-annual basis by RMG and the results of the review are reported to the Operations Review Committee and the Board Risk Committee.

Concentrations within the equity portfolio are managed by a number of additional limits approved by the Executive Committee and/or the Board. These include limits on:
- property equity investments
- investments in the resources sector
- lease residuals (by type of leased asset)
- co-investments and other assets of Macquarie Capital.

Transaction review and approval process
The division executing the transaction is responsible for due diligence and risk analysis of each equity investment. For material deals, RMG undertakes shadow due diligence and performs a comprehensive analysis of all risks and potential losses associated with the acquisition such as:
- market and credit risks
- regulatory, capital, liquidity and compliance requirements
- business, operational and reputation risks.

All material equity risk positions are subject to approval by RMG and by the CEO, Executive Committee and the Board, depending on the size and nature of the risk. RMG ensures that the transaction is correctly represented to the relevant approvers.

Operational risk
Macquarie defines operational risk as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Macquarie has established procedures and controls to manage market, credit, reputation and strategic risks. The potential for failure or inadequacy in these procedures and controls is classified as an operational risk. Operational risk failures could lead to reputation damage, financial loss or regulatory consequences.

RMG is responsible for ensuring an appropriate framework exists to identify, assess and manage operational risk and that resources are available to support it. RMG is also responsible for Macquarie’s operational risk capital measurement methodology.

In general, changes in Macquarie’s operational risk profile are the net result of greater innovation and growth. This is offset by constant gradual adaptation and development of the control environment to accommodate new risks.

Operational Risk Management framework
Macquarie’s Operational Risk Management Framework (ORMF) is designed to identify, assess and manage operational risks within the organisation. The key objectives of the framework are as follows:
- risk identification, analysis and acceptance
- execution and monitoring of risk management practices
- reporting and escalation of risk information on a routine and exception basis.

Businesses carry out elements of the ORMF in a manner that is tailored to their specific operational risk profile. However, to ensure consistency and minimum standards the framework includes the following mandatory elements:
- a robust change management process to ensure operational risks in new activities or products are identified, addressed and managed prior to implementation
- a semi-annual operational risk self assessment process to identify operational risks at the business level, assess controls and develop action plans to address deficiencies
- recording of operational risk incidents into a centralised reporting system. Incidents are analysed to identify trends and establish lessons learnt on the effectiveness of controls
- allocation of operational risk capital to all Macquarie businesses as a tool to further encourage positive behavior in Macquarie’s day-to-day management of operational risk
- Macquarie-wide policies that require a consistent approach and minimum standards on specific operational risk matters
- embedded operational risk representatives in Operating Groups who act as delegates of the Operating Group Head. These representatives are required to assess whether operational risks are addressed appropriately and that the ORMF is executed within their area.

Macquarie’s operational risk capital framework
Macquarie’s framework for operational risk capital has two main elements:
- an annual scenario approach for modelling operational risk losses and to determine operational risk capital
- a quarterly scorecard analysis that is used to update operational risk capital between scenario analyses, and as a basis for updating the allocation of capital to businesses.

Operational risk scenarios identify key risks that, while very low in probability may, if they occurred, result in very high impact losses. In identifying the potential for such losses consideration is given to the individual statistical distribution for each scenario, external loss data, internal loss data, risk and control factors determined by the operational risk self assessments, and the contribution of expert opinion from businesses. Scenario estimates are then modelled to determine the operational risk component of regulatory capital required to be held by Macquarie at the 99.9th
percentile level. Monte Carlo techniques are used to aggregate these individual distributions to determine a Macquarie-wide operational risk loss distribution. The model also reflects recent changes in operational risk capital regulatory requirements.

Over time operational risk capital changes to reflect:
- new business activity, business growth and significant change in activity that may require new or increased loss scenarios and/or an increased loss probability
- decreases in the probability of loss as business changes bed down and the control environment continues to mature, reducing the capital requirement
- changes in the external environment such as new regulations or movements in the economic cycle that also influence scenario estimates.

Macquarie allocates capital to individual businesses. The capital allocation effectively rewards positive risk behaviour and penalises increased risks. This is done using scorecards that measure changes in a number of key factors such as the size and complexity of the business, risk and control assessments, incident and exception management and governance. The quarterly change in the sum of divisional capital is also used as an estimate to update the Macquarie capital requirement between annual assessments.

**Assessment of aggregate risk**

Macquarie has developed an economic capital model that quantifies Macquarie’s aggregate level of risk.

The economic capital framework complements the management of specific risk types such as equity, credit, market and operational risk by providing an aggregate view of Macquarie’s risk profile.

The economic capital model is used to support business decision-making and has three main applications:
- capital adequacy assessment
- risk appetite setting
- risk-adjusted performance measurement.

**Capital adequacy assessment**

Macquarie assesses capital adequacy for both Macquarie Group and Macquarie Bank. In each case, capital adequacy is assessed on a regulatory basis and on an economic basis, with capital requirements assessed as follows:

<table>
<thead>
<tr>
<th>Economic</th>
<th>Regulatory</th>
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<tbody>
<tr>
<td>Macquarie Bank</td>
<td>Internal model, covering exposures of the Banking Group</td>
</tr>
<tr>
<td>Macquarie Group</td>
<td>Internal model, covering all exposures of Macquarie Group</td>
</tr>
</tbody>
</table>

Economic capital adequacy means an internal assessment of capital adequacy, designed to ensure Macquarie has sufficient capital to absorb potential losses and provide creditors with the required degree of protection.

Potential losses are quantified using the Economic Capital Adequacy Model (ECAM). These potential losses are compared to the capital resources available to absorb loss, consisting of book equity and eligible hybrid equity. Earnings are also available to absorb losses, however only a fraction of potential earnings are recognised as a buffer against losses.

The ECAM quantifies the following types of risk:
- equity risk
- credit risk
- operational risk
- traded market risk.

The ECAM also covers insurance risk, underwriting risk, non-traded interest rate risk and the risk on assets held as part of business operations, e.g., fixed assets, goodwill, intangible assets, capitalised expenses and certain minority stakes in associated companies or stakes in joint ventures.

The regulatory capital requirement of Macquarie’s non-banking entities as agreed with APRA is determined by the ECAM. Macquarie is currently well capitalised – a substantial regulatory capital surplus exists. An element of this surplus is set aside as a buffer against volatility in the drivers of capital adequacy. The remaining capital surplus is available to support growth and provide strategic flexibility.

In order to reduce volatility in Macquarie’s capital adequacy, Macquarie actively manages the sensitivity of its capital position to foreign currency movements. This is achieved by leaving specific investments in core foreign operations exposed to foreign currency translation movements. The resultant change in the Australian dollar value of the foreign investment is captured in the Foreign Currency Translation Reserve, a component of regulatory capital. This offsets the corresponding movement in the capital requirements of these investments.

The Common Equity Tier 1, Tier 1 and total capital ratios for the Banking Group as at 31 March 2014 were 9.8 per cent, 10.6 per cent and 12.6 per cent respectively.

The capital adequacy results are reported to the Board and senior management on a regular basis, together with projections of capital adequacy under a range of scenarios.

**The Risk Appetite Test – an aggregate stress test**

The key tool that the Board uses to quantify aggregate risk appetite is the Risk Appetite Test. This is a Macquarie-wide stress test that considers losses and earnings under a severe economic downturn scenario with the aim of Macquarie emerging from the severe downturn with sufficient capital to operate.

The Risk Appetite Test asserts that potential losses must be less than the Global Risk Limit, which comprises underlying earnings that Macquarie can achieve in a three-year downturn (downturn forward earnings capacity) plus surplus regulatory capital. Consideration is also given to the year by year outcome of the modelled downturn scenario to ensure that market confidence is maintained.
Downturn forward earnings capacity is estimated by the Operating Groups and divisions with reference to a three year downturn scenario provided to them by RMG.

Aggregate risk can be therefore broken down into two categories:
- **business risk** – meaning decline in earnings through deterioration in volumes and margins due to market conditions
- **potential losses** – including potential credit losses, write-downs of equity investments, operational risk losses and losses on trading positions.

Business risk is captured by the difference in base case and downturn forward earnings estimates. Potential losses are quantified using a version of the economic capital model.

A principal use of the Risk Appetite Test is in setting the Equity Risk Limit (ERL). This limit constrains Macquarie’s aggregate level of risk arising from principal equity positions, managed fund holdings, property equity investments, lease residuals and other equity investments. Any changes to the ERL are sized to ensure that even under full utilisation of this limit, and allowing for growth in other risk types, the requirements of the Risk Appetite Test will be met.

**Liquidity risk**

**Liquidity management**

The two primary external funding vehicles for Macquarie are MGL and MBL. MGL provides funding principally to the Non-Banking Group and limited funding to some MBL Group subsidiaries. MBL provides funding to the Banking Group.

The high level funding structure within Macquarie is shown below.

Macquarie’s liquidity risk management framework is designed to ensure that both MGL and MBL are able to meet their funding requirements as they fall due under a range of market conditions.

Liquidity management is performed centrally by Group Treasury, with oversight from the Asset and Liability Committee and RMG. MGL and MBL liquidity policies are approved by the respective Boards after endorsement by the Asset and Liability Committee and liquidity reporting is provided to the MGL and MBL Boards on a monthly basis.

The Asset and Liability Committee includes the CEO, MBL CEO, CFO, CRO and Business Group Heads.

RMG provides independent prudential oversight of liquidity risk management, including the validation of liquidity scenario assumptions, liquidity policies, and the required funding maturity profile.

**Liquidity policy and principles**

MGL provides funding predominantly to the Non-Banking Group. As such, the MGL Liquidity Policy outlines the liquidity requirements for the Non-Banking Group. MGL’s risk appetite is set so that MGL is able to meet all of its liquidity obligations during a period of liquidity stress: a 12 month period with no access to funding markets and with only a limited impact on franchise businesses.

Reflecting the longer term nature of the Non-Banking Group asset profile, MGL is funded predominantly with a mixture of capital and long-term wholesale funding.

The MBL Liquidity Policy outlines the liquidity requirements for the Banking Group. MBL’s risk appetite is set so that MBL is able to meet all of its liquidity obligations during a period of liquidity stress: a 12 month period of constrained access to funding markets and with only a limited impact on franchise businesses.

MBL is funded mainly by capital, long-term liabilities and deposits.
The liquidity risk appetite is supported by a number of risk tolerances and management principles Macquarie applies to oversee liquidity risk in both MGL and MBL:

**Risk Tolerances**
- term assets must be funded by term liabilities
- cash and liquid assets are sufficient to cover a 12 month stress scenario
- cash and liquid assets held to meet stress scenarios must be unencumbered liquid assets and cash
- short-term assets exceed short-term wholesale liabilities
- diversity and stability of funding sources is a key priority
- balance sheet currency mismatches are managed within set tolerances
- funding and liquidity exposures between entities in the Macquarie Group are subject to constraints where required.

**Liquidity Management Principles**
- Macquarie has a centralised approach to liquidity management
- liquidity risk is managed through stress scenario analysis and setting limits on the composition and maturity of assets and liabilities
- a Regional Liquidity Framework is maintained that outlines Macquarie’s approach to managing funding and liquidity requirements in offshore subsidiaries and branches
- the liquidity position is managed to ensure all obligations can be met as required on an intraday basis
- a Liquidity Contingency Plan is maintained that provides an action plan in the event of a liquidity ‘crisis’
- a funding strategy is prepared annually and monitored on a regular basis
- internal pricing allocates liquidity costs, benefits and risks to areas responsible for generating them
- strong relationships are maintained to assist with managing confidence and liquidity
- the MBL and MGL Boards and senior management receive regular reporting on Macquarie’s liquidity position, including compliance with liquidity policy and regulatory requirements.

**Scenario analysis**
Scenario analysis is central to Macquarie’s liquidity risk management framework. Group Treasury models a number of liquidity scenarios covering both market wide and firm-specific crises. The objective of this modelling is to ensure the ability of MGL and MBL to meet all repayment obligations under each scenario and determine the capacity for asset growth.

The scenarios separately consider the requirements of the Banking Group, Non-Banking Group and the Consolidated Entity. They are run over a number of timeframes and a range of conservative assumptions are used including access to capital markets, deposit outflows, contingent funding requirements and asset sales.

**Liquid asset holdings**
Group Treasury maintains a portfolio of highly liquid unencumbered assets in both MGL and MBL to ensure adequate liquidity is available in all funding environments, including worst case wholesale and retail market conditions. The minimum liquid asset requirement is calculated from scenario projections and complies with regulatory minimum requirements.

To determine the minimum level of liquid assets, reference is made to the expected minimum cash requirement during a combined market-wide and firm-specific crisis scenario over a 12 month timeframe. This scenario assumes no access to new funding sources, a significant loss of deposits and contingent funding outflows resulting from undrawn commitments, market moves impacting derivatives and other margined positions. The size of the liquid asset portfolio must exceed the minimum requirement as calculated in this model at all times.

The liquid asset portfolio contains only unencumbered assets that can be relied on to maintain their liquidity in a crisis scenario. At least 90 per cent of the liquid asset portfolio held to meet the minimum liquid asset requirement must be eligible for repurchase with a central bank, either by Macquarie or other counterparties. The remainder must be approved by Group Treasury and RMG before inclusion in the liquid asset portfolio. As at 31 March 2014, 97 per cent of the liquid asset portfolio was eligible for repurchase with a central bank.

The liquid asset portfolio typically includes unencumbered cash and central bank repo eligible government, semi-government, supranational, government guaranteed bank and unguaranteed bank securities and AAA rated Australian residential mortgage backed securities. In addition, the portfolio includes other very short dated, high quality liquid assets such as A-1+ rated Australian residential mortgage backed securities.

The liquid asset portfolio is largely denominated and held in Australian dollars although liquid assets denominated in US dollars or other currencies are held where appropriate.

**Liquidity contingency plan**
Group Treasury maintains a liquidity contingency plan. The liquidity contingency plan applies to the entire Macquarie Group and defines roles and responsibilities and actions to be taken in a liquidity event. This includes identification of key information requirements and appropriate communication plans with both internal and external parties.

Specifically, the plan details factors that may constitute a crisis, the officer responsible for enacting the contingency management, a committee of senior executives who would be responsible for managing a crisis, the information required to effectively manage a crisis, a public relations strategy, a high level check list of possible actions to conserve or raise additional liquidity and contact lists to facilitate prompt communication with all key internal and external stakeholders. The liquidity contingency plan is subject to regular review (at least annually) by both Group Treasury and RMG and is submitted to the Board for approval.

Macquarie is a global financial institution, with branches and subsidiaries in a variety of countries. Regulations in certain countries may require some branches or subsidiaries to have specific local contingency plans. Where that is the case, the liquidity contingency plan contains a supplement providing the specific information required for those branches or subsidiaries.
Funds transfer pricing
An internal funds transfer pricing framework is in place that has been designed to produce appropriate incentives for business decision-making by reflecting the true funding costs arising from business actions. Under this framework, each business is allocated the full cost of the funding required to support its products and business lines, recognising the actual and contingent funding-related exposures their activities create for the group as a whole. Businesses that raise funding are compensated at a level that is appropriate for the liquidity benefit provided by the funding.

Regulatory and compliance risk
The Compliance Division is an independent function responsible for ensuring that all Compliance Risks are appropriately assessed and managed across Macquarie.

In line with the core risk management principle of risk ownership, business heads are responsible for identifying risks within their businesses and ensuring that they are managed appropriately. The Compliance Division enables business management to fulfil these supervisory responsibilities by establishing a robust and effective compliance framework, and by performing an advisory, training and monitoring role in respect of the compliance risks arising from Macquarie’s business activities.

The Compliance Division communicates and delivers on its priorities by defining and implementing a risk-based compliance program that sets out planned activities, such as the implementation and review of specific policies and procedures, compliance testing and staff training. The compliance program is overseen by the Global Head of Compliance to ensure appropriate coverage across businesses and co-ordination among other risk management functions.

The Head of Compliance reports directly to the CRO.

The Head of Compliance has free access to the BGCC at any time and meets privately with the BGCC at least once a year.

The RMG Compliance role is closely supported by RMG Prudential, Capital & Markets (PCM) to ensure compliance with prudential standards and consistency of Macquarie’s approach to prudential regulation globally.

Legal risk
Legal risk includes the risk that:
- transactions are not capable of being enforced as expected
- business does not adequately understand the legal and regulatory framework in which it operates
- the organisation may be found to be responsible for a claim based on a breach of contract, law or regulation.

Legal risk is managed through identification and assessment of legal risk, and by minimising or mitigating legal risk as far as reasonably practical. Responsibility for legal risk lies with Macquarie’s businesses in conjunction with Legal and Governance. The Head of Legal and Governance, the General Counsel, is a member of Macquarie’s Operations Review Committee and reports directly to the CEO. The General Counsel has access to the Board and any Board committees. Each Macquarie Operating Group has a business General Counsel who reports to the General Counsel and to the relevant Operating Group Head.

Reputation risk
All activities have embedded elements of reputation risk. Managing reputation risk is an essential role of senior management as it has the potential to impact both earnings and access to capital. Macquarie seeks to manage and minimise reputation risk through its corporate governance structure and risk management framework.

Macquarie operates under a strong corporate governance structure consistent with the regulatory requirements of various regulators including the Australian Securities & Investments Commission (ASIC), the Australian Securities Exchange (ASX) and Australian Prudential Regulation Authority (APRA). Goals and Values incorporating a clear code of ethics are communicated to all staff and regional Integrity Officers deal with potential issues of integrity.

Operating Groups take ownership of risk, including reputation risk. In addition, a robust, independent risk management framework incorporates active management and monitoring of risks arising within Macquarie. The operation of this framework and oversight by RMG are major mitigants to reputation risk.

The various policies, procedures and practices in place aim to minimise reputation risk. Regular reporting to the Operations Review Committee and Boards includes detail on reputation risk issues as appropriate.

The direct financial losses arising from reputation risk (such as breach of mandates and regulatory fines) as well as legal costs are taken into account in the operational risk capital model.

Internal Audit
Internal Audit provides independent assurance to Management and the Board on the quality and effectiveness of Macquarie’s internal control, risk management and governance systems and processes. Internal Audit provides an independent and objective assessment as to whether risks have been adequately identified; adequate internal controls are in place to manage those risks; and whether those controls are working effectively. Internal Audit is independent of both business management and the activities it reviews.

The Head of Internal Audit is jointly accountable to the BAC and the CRO. The BAC approves the appointment and removal of the Head of Internal Audit who has unlimited access to the BAC.

Basel III
Macquarie Bank is accredited under the Foundation Internal Ratings Based Approach (FIRB) for credit risk, the Advanced Measurement Approach (AMA) for operational risk, the internal model approach for market risk(1) and the internal model approach for interest rate risk in the banking book.

These advanced approaches place a higher reliance on a bank’s internal capital measures and therefore require a more sophisticated level of risk management and risk measurement practices.

(1) Standard approach applied for specific risk on debt securities.