Risk Management Framework Assessment
Government Pension Fund - Global ('GPFG')

Contents

Introduction & Background

This report summarises the findings and recommendations resulting from our review of Norges Bank's Risk Management and Control ('RM&C') procedures with respect to the management of the Government Pension Fund – Global ('GPFG' or 'the Fund'), undertaken between November 2006 and June 2007 (on-site visits terminated in April 2007). This review was carried out on behalf of the Norwegian Ministry of Finance ('the Ministry') in its capacity as investor and supervisor, as defined by Storting in the Pension Fund Act.

GPFG: Overview

The Fund is managed by a long standing management team led by Knut Kjaer, Norges Bank Investment Management ('NBIM') Executive Director ('ED'). Over the last six years this team has overseen the growth of GPFG to over NOK 1,900 billion, consistently delivering against the Tracking Error budget set down by the Ministry.

The Fund has significantly exceeded the growth forecast envisaged for the first few years after the initial capital allocations. Currently 150-strong with offices in Oslo, London and New York, NBIM is also planning to open an office in Asia by the end of 2007. According to projections in the 2007 National Budget, it is estimated that the GPFG market value will increase by about 70% by 2010, to just over NOK 3,000 billion.

The management of the Fund is based on a set of formal documentation and reporting requirements defined by the Ministry, a Management Agreement between the Bank and the Ministry, the Central Bank Act, as well as by guidelines and regulations (e.g. job descriptions, investment mandates) set by NBIM's ED.

For cost efficiency and process effectiveness purposes, as well as to leverage on the pool of investment talents available in the market, the Fund's business model relies substantially on external providers, including:

- 50 external fund managers who manage 40% of the assets and 60% of the risk.
- Investors Bank & Trust (IBT), providing back office services for internal mandates.
- JP Morgan and Citibank, providing custody and fund accounting services for both internal and external mandates.
- RiskMetrics, providing risk analytics and technology support.

Context of the Review

Ultimately responsible for the management of GPFG, the Ministry delegates the operational management of the Fund to Norges Bank who delivers against this responsibility through its investment management division, NBIM.

In a letter to the Ministry dated 11th March 2005, Norges Bank recommended several changes to the framework that governs the operational management of the Fund. The following changes were agreed by the Ministry:

- Removing the minimum credit rating requirement for bonds, and adding a provision to curb counterparty risk.
- Removing the regulations' requirement of an interval for the duration of the bond portfolio (measure of interest rate sensitivity).
- Providing general access to use instruments naturally related to investments in permitted asset classes, including derivatives and funds.

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- Allowing use of commodity contracts.
- Lifting the rule limiting equity investments in emerging markets to a maximum of five per cent.

Norges Bank recognised that these changes would increase the potential risk profile of the Fund and that, as a consequence, more stringent requirements would need to be put in place in the area of risk measurement, management and control.

Subsequent to an official tender process, the Ministry appointed us, Ernst & Young ('E&Y'), to undertake a due diligence exercise to review and assess the approach applied by Norges Bank to manage the Fund. The specific objectives of this review are detailed below.

More information related to the context of this tender can be found in the tender document itself.

Project objectives and Scope of the review

The Ministry requested us to comment on the appropriateness of the Fund's RM&C procedures and the related governance arrangements:

- In the context of the current actual use of the allowed investment universe and Tracking Error mandate.
- In the context of a potentially extended use of the entire authorised investment universe, allowing investment in riskier Over The Counter ('OTC') products to support a strategy with more emphasis on active management and absolute return.

The specific objectives of the assignment were as follows:

1. Leading Practice & Internationally Accepted Standards

- Define what international standards and leading market practice the Ministry of Finance should apply in the operational implementation of point 4 "Requirements on valuation, return measurement and management and control of risk (Market, Counterparty and Operational)" as defined within the 'Provisions on the Management the Government Pension Fund – Global'.

2. Evaluation of Current Practice

- Evaluate Norges Bank's investment management framework in accordance with the findings related to Objective 1.
- Verify that Norges Bank is modelling the expected Tracking Error in a satisfactory manner.
- Verify that Norges Bank's procedures for handling risk outside of the boundaries of the tracking error measurement system are sufficiently sound.

3. Governance Structure

- Propose a monitoring system that enables the Ministry to keep an updated priority list of relevant areas for future due diligence projects as Norges Bank is expected to gradually expand the investment universe.

We were asked in particular to benchmark Norges Bank's governance and risk management structure in relation to asset management, against the requirements set by the Financial Services Authority ('UK FSA') for private asset managers in the United Kingdom.

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Our Approach

In line with the approach presented in our Engagement Letter, our work included the following five steps:

1. Design a questionnaire to be used by Norges Bank to report the boundaries of the approved investment universe and to provide a self-assessment of their current RM&C practices.
2. Produce a plan for the review of NBIM RM&C environment based upon the results of the self-assessment.
3. Provide a framework for best practice and internationally accepted standards for the management of Credit, Counterparty, Market and Operational Risk.
4. Undertake an independent assessment of the management of the Fund within the above mentioned areas.
5. Prepare a final report with recommendations and a list of areas for future review and action.

Our findings are organised under five sections: (1) Overall Governance arrangements (Section 2), Operational Risk (Section 3), Market Risk (Section 4), Credit Risk (Section 5), and Performance & Valuation (Section 6).

The legal structure, the size of the portfolio, the asset and liability profile of the Fund, its mandate, as well as the corporate structure under which it operates, make NBIM a unique organisation. We have drawn on our experience of the investment management industry to identify key components and principles that operate within what we would describe as 'leading practice' risk management frameworks in a regulated environment, such as that driven by the UK FSA.

It is against those principles that we have made our assessment and recommendations. These principles were presented to and discussed with NBIM's Management during a series of workshops held in Oslo.

Limitation of Scope

In carrying out our work and preparing our report we have worked solely on the instructions of the Ministry, and for the Ministry's purposes. Our report may not have considered issues relevant to any third parties. Any use such third parties may choose to make of our report is entirely at their own risk and we shall have no responsibility whatsoever in relation to any such use.

Our review was limited to RM&C processes internal to Norges Bank as they apply to GPFG. We did not review the processes and controls implemented by any of the Fund's external providers.

During our work we have relied solely on information made available to us by Norges Bank and NBIM, either through written documents deposited with the Ministry, through interviews undertaken in Oslo and London with key management representatives, or through limited screen consultation of NBIM's intranet system. We have received this information in good faith and did not:

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- Seek to independently validate or audit its completeness and its integrity. This applies in particular to the questionnaire responses, as well as to verbal representation or written evidence provided by Norges Bank and NBIM.
- Verify the appropriate implementation and effectiveness of the control environment described to us.
- Perform a detailed review or an audit of the Information Technology infrastructure supporting NBIM's operations.

We observed that a number of key initiatives were on the way within NBIM at the time of our review. These initiatives are aimed at enhancing the Fund's operating framework in particular in the Operational Risk area. Our comments and recommendations are subject to a continuous commitment from NBIM Management to implement these initiatives appropriately and on a timely basis.

Acknowledgment

We would like to thank Norges Bank and NBIM for the time made available to us during our review, and for the engaged discussions that resulted from our meetings with their representatives.

Governance

Introduction and Context

We typically identify six key components within a leading practice risk frameworks, as shown in Figure 1 Appendix A, It is against these components that we have assessed the Fund's RM&C environment.

Our comments in the rest of this section, dedicated to Governance arrangements, are articulated around four key areas within a best practice Governance framework:

(i) Roles and Responsibilities

(ii) Risk Policy

(iii) Risk Appetite

(iv) Assurance and Reporting

Governance: Roles and Responsibilities

Statements of Principle

For each risk class (Operational, Market and Credit) there should be a clearly defined and assigned 'Governing Bodies' with Terms of Reference that set out their role towards the establishment and oversight of an appropriate risk management framework for each particular risk class.

A Governing Body should be composed of individuals with appropriate skills and expertise to oversee the effectiveness of the risk framework, set risk appetite limits, and establish and maintain suitable monitoring procedures for any breaches or exceptions to the risk appetite limits.

The Governing Body should approve the Terms of Reference and objectives for the Risk Management Function, including the setting of measurable objectives and performance measures in connection with the relevant risk classes.

The Governing Body should approve the Terms of Reference and objectives for the Internal Assurance Function with regards to the independent assurance testing of the effectiveness and performance of the risk management framework.

Assessment and Observations

Five different Governing Bodies are relevant to NBIM's risk management and governance framework:

- *Parliament* ('*the Storting*'), which approves the major strategic decisions and guidelines that define most of the expected return and the Market and Credit Risks of the Fund. Parliament has delegated the management of the Fund to the Ministry.
- *The Ministry*, which defines the most important aspects of the Fund's management including the setting of benchmarks, maximum deviation expected from the benchmark and other specific guidelines for the management of the Fund (including investment universe criteria). The management of the Fund is delegated by the Ministry to the Executive Board of Norges Bank.

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- The *Supervisory Council*, reporting directly to the Storting, which supervises Norges Bank's activities and ensures that the rules governing the operations of the Bank are observed. The Council comprises fifteen members, all elected by the Storting. Its responsibilities include formal approval of the Bank's financial statements, adoption of the Bank's budget and arrangements for the hiring of and the instructions to the Central Bank's auditor, Norges Bank Audit.
- The *Executive Board of Norges Bank*. The Governor (who is also Chairman of the Board) has delegated the management of the Fund to NBIM, the fund management unit of Norges Bank. NBIM also manages the bulk of Norges Bank's currency reserves and the Petroleum Insurance Fund. The Executive Board issues directives on subject matters that are common to the entire Norges Bank organisation, including internal control principles and IT security. Some of the risk control requirements NBIM is subject to are therefore a part of the Bank's common framework. The Board determines the strategic plans and goals of NBIM, proposes the annual budgets and action plans to the Supervisory Council and monitors NBIM's results and key organisational developments against plans and budgets.
- The *NBIM Executive Management team ('NBIM Management')*, who has the delegated responsibility for many of the detailed guidelines underlying GPFG's operations, including Operational Risk.

Another specific feature of Norges Bank's (and NBIM's) risk organisation is the dual role of Norges Bank Audit:

- First, as statutory external auditor, providing an opinion on the Bank's financial statements to the Supervisory Council.
- Second, in a role similar to that of an Internal Audit function, undertaking a number of operational audits on behalf of the Supervisory Council. The operational audit plan for the year is discussed with Norges Bank's Executive Board and formally approved by the Supervisory Council. Audit reports are generally presented to both the Executive Board and the Supervisory Council.

A number of documents formally describe the role of the Governing Bodies listed above, as well as the broader risk management framework within Norges Bank and NBIM. We observe however, that while there does not appear to be a material absence of risk management and oversight in practice, there is a need for clearer and more specific statements with respect to the responsibilities of each of the Governing Bodies in relation to Market, Credit, and Operational Risk management.

We believe that the definition of more specific roles and responsibilities for all the RM&C framework stakeholders, including the Governing Bodies, is key to ensure clear risk management accountability, adequate oversight and effective communication. This will be increasingly important given NBIM's significant growth plans.

Recommendations

1. Responsibilities of each of the Governing Bodies with respect to Market, Credit and Operational Risks should be described and documented at a more granular level.

2. Risk monitoring and reporting requirements for each Governing Body should be described more specifically. These should be aligned to the defined risk management responsibilities.

Governance

3. The reporting should be sufficient (in content and frequency) to allow each Governing Body to routinely demonstrate that it is operating within a formal framework that provides adequate oversight and monitoring of its respective risk management role and responsibilities.

4. The rapid growth of assets under management and the growing complexity of the investment portfolio make the adequate supervision and governance of the Fund an increasing challenge. We therefore believe that it is key for the Governing bodies to have access to adequate and independent investment management technical expertise. The strengthening of Norges Bank's Audit function (see 'Assurance & Reporting' below) should provide a useful access to this expertise. We would also recommend the establishment of an international panel of experts, available to the Ministry and/or the Supervisory Council to provide independent leading practice advice and challenge on supervisory and risk management matters related to NBIM.

Governance

Governance: Risk Policy

Statements of Principle

The Risk Policy statements should clearly define the escalation protocols for dealing with exceptions to the Policy, including breaches of the risk appetite limits, or major events and matters of significance.

Assessment and Observations

Market Risk and Credit Risk limits and policies are established through the investment mandate provided by the Ministry. However escalation procedures for Market and Credit limit excesses are not very detailed within NBIM.

Equally for Operational Risk, the Executive Director's Guidelines ('EDG') only include a broad description of what should be escalated to the Executive Board. NBIM is indeed required to report 'matters of significance' to the Executive Board of Norges Bank. Whilst there seems to be an understanding between Norges Bank's and NBIM's Senior Management teams of what constitutes a 'matter of significance', there is a lack of formal and granular guidance describing what defines such a matter. There is therefore a strong reliance on individual 'corporate knowledge' and personal judgment.

We have reviewed the design principles of the new Operational Risk framework and are satisfied that the issues raised above are addressed. At the time of our review however, the implementation of the new design principles was a work-in-progress. We are therefore unable to assess how the new escalation protocols will operate in practice.

Recommendations

1. We recommend a more detailed definition of escalation procedures for each risk class setting out, amongst others, the criteria under which and how significant matters of exception should be reported directly to the relevant Governing Body.

2. The escalation protocols and thresholds for reporting and monitoring Operational Risks should be expressly defined and approved by the relevant Governing Bodies. 'Matters of significance' should be formally defined by Norges Bank's Executive Board and NBIM Senior Management, and communicated throughout the business lines.

3. We recommend regular independent reviews of the escalation process across risk classes in order to ensure its effectiveness and efficiency.

Governance

Governance: Risk appetite (tolerance) limits

Statements of Principle

The risk appetite limits should include practically measurable expressions of risk for all major risk classes.

The relevant Governing Bodies should approve the process for setting and approving risk appetite limits. Typically, this process should also include clear guidance on who ‘owns’ the responsibility for limit monitoring.

Assessment and Observations

The Investor’s appetite for Market and Credit risks is defined within the investment mandate provided by the Ministry. NBIM’s ED allocates this overall appetite between the Fixed Income (‘FIBA’) and Equity (‘EBL’) divisions.

The roll-out of the new Operational Risk framework should deliver enhanced risk appetite limit statements. To compare favourably against leading practices, these statements should contain a mixture of quantitative and qualitative measures. Operational risks of most concern to NBIM Management, including Reputation and Regulatory Risks, should be clearly defined, with measurable risk limits set against each of these risks.

Recommendations

1. Risk appetite for each risk class, (Operational, Market and Credit) should be formally defined and approved by the Governing Body with primary responsibility for that relevant risk class.

2. We recommend that clear and specific Operational Risk appetite statements are developed as part of the roll-out of the new Operational Risk framework.

3. We recommend that Market Risk and Credit Risk appetites are more tightly defined, including for instance limits on stress positions. This is particularly relevant in the context of a potentially extended use of the entire authorised investment universe, which allows investment in riskier OTC products and a strategy with more emphasis on active management and absolute return.

Governance

Governance: Assurance and Reporting

Statements of Principle

A clearly articulated process should exist to ensure organisation-wide assurance and reporting to the highest levels within the governing arrangements (as set down by the relevant Governing Bodies for each risk class).

Typically, Governing Bodies should also define their expectations around the content of the risk reports.

Assessment and Observations

Leading practice risk management frameworks are based on the concept of 'Three Lines of Defence' and define clear roles and responsibilities for each key stakeholder. This concept is regularly applied by the UK FSA in its supervision of investment management firms.

An overview of this concept is shown in Figure 2, Appendix B, and was discussed in detail with NBIM during our review:

The efficiency and effectiveness of the 'First Line of Defence' (i.e. the line managers in the business lines) should be demonstrated through substance as well as form:

- **'Substance'** refers to the actual control activities undertaken by the business lines and the effectiveness of these controls in addressing the key risk areas. Examples include:
  - Segregation of duties;
  - Systems based controls;
  - Authorisation sign-offs.
- **'Form'** refers to the evidence that demonstrates that these control activities are taking place so that the rest is being managed in line with the wishes of the Governing Bodies.

  In practice, this requires clear roles and responsibilities as well as a clearly defined and robust training and competence regime, for which the Governing Bodies are ultimately responsible and accountable. Sarbanes Oxley and Basel II regulatory regimes introduce the concept of 'control ownership' which explicitly includes the responsibility for documenting and evidencing the performance of the control.

The 'Second Line of Defence', which includes the Risk Management function as well as functions such as Financial Controls, Legal and Compliance, should be able to demonstrate that it is independent from the Senior Management of the business lines, while closely engaged with the business to operate effectively. We see NBIM's Risk Performance & Accounting ('RPA') function as a key component of this line.

An overview of the typical scope of the Risk Management function, within this 'Second line of Defence' is shown in Figure 3, Appendix C.

The 'Third Line of Defence', Norges Bank Audit in NBIM's case, should be provided with the capabilities (scope of mandate, access to technical skills, manpower and resources) to provide on-going independent assurance on the appropriateness and effectiveness of the risk management framework, across Operational, Market and Credit risks. Any matters of significant exception should be reported to the Supervisory Council and the Executive Board of Norges Bank.

Governance

An overview of the typical responsibilities of this 'Third Line' is shown in Figure 4, Appendix D:

We understand that Norges Bank and Norges Bank Audit have decided to strengthen the Bank's (and therefore NBIM's) audit structure through two key initiatives:

- The establishment of a new internal audit department, formally reporting to the new Audit Committee of the Bank's Executive Board.
- The establishment of a joint audit arrangement with one of the major international audit firms for the audit of the Fund.

Recommendations

1. We welcome the fact that NBIM has undertaken to strengthen its 'Second Line of Defence' through the recruitment of a dedicated Chief Financial Officer ('CFO') and a dedicated Chief Risk Officer ('CRO'). We strongly endorse this initiative, as we believe it is key to the development of a robust support infrastructure for NBIM going forward.
2. We believe that the RPA function should be given a higher profile and a broader mandate around the independent monitoring and reporting of risk positions, to include more detailed and comprehensive reporting requirements. More management horsepower provided by the new CFO and/or CRO combined with a broader mandate, should allow NBIM to hire and retain a critical mass of suitably skilled risk analysts able to provide constructive and independent challenge to the business.
3. We welcome the changes to the audit structure, which should provide the audit function with access to appropriate investment management subject matter expertise and, therefore, an increased ability to identify risk issues and challenge the business. In addition, we recommend that the scope and depth of the review by the Audit function of the internal control framework be enhanced in line with internationally recognised SAS 70 standards and protocols.

Operational Risk

Introduction and Context

As described above in the 'Governance' section, for each risk class (Operational, Market and Credit) we have characterised our view of a leading practice risk management framework through six key components: (i) Governance, (ii) Risk Identification, (iii) Risk Assessment and Measurement, (iv) Risk Monitoring and Management, (v) Supporting Technology and (vi) Risk Reporting and Management Information. It is against these components that we have assessed the Fund's RM&C framework.

In the case of Operational Risk, we recognise that NBIM has initiated a significant project to enhance its risk framework. At the time of our review, the project was underway and not yet complete. We took in good faith the representations from NBIM Management that the project was on track and that the milestones were achievable within the timescales set out in the project plan. It is in the context of these representations that our recommendations have been made.

At the time of our review the roll-out of the new framework was due for completion during April 2007. The embedding of the framework however is likely to take longer, since it will take time for the business to become familiar with the new protocols, policies and reporting requirements.

Operational Risk: Governance

Statements of Principle

Clear roles and responsibilities should be established and approved by the relevant Governing Bodies, for the identification, assessment, monitoring, reporting and management of Operational Risk.

The risk framework should be clearly articulated through a risk policy document defining the principles and guiding methodology around identification, measurement, assessment, monitoring and reporting.

The 'tone from the top' should be articulated through clearly defined risk appetite limits. These limits should be described in tangible, measurable terminology such that it is clear which risks are acceptable to take, and which risks are unacceptable.

Once the risk appetite limits have been established, a clear process should be defined for regular monitoring and reporting against those limits.

Assessment and Observations

In 2006, the NBIM Management designed an improved Operational Risk framework with support from external advisors. We have reviewed the documentation describing the design principles underlying the framework, including the governance arrangements, the identification principles, the standards and methodologies for assessing, monitoring and reporting the risks, and the proposed implementation plan. Our view is that the new design principles compare favourably against leading practice.

The Operational Risk framework takes into account the significant reliance placed on outsource providers (e.g. JPMorgan Chase). The framework recognises that although the operational activities may be delegated to a third party, the responsibility for risk management remains with the senior management of NBIM. Accordingly, third party risk monitoring and management frameworks have been defined to address this. We believe that these frameworks compare favourably against leading practice.

Operational Risk

Recommendations

1. The roll-out and implementation of the new Operational Risk framework should deliver a number of improvements to the governance arrangements, if they are to compare favourably against leading practice. The key governance improvements that need to be delivered are:

   a. A formal definition of the Operational Risk appetite. The definition should be explicitly linked to key Operational Risk stress scenarios that are of most concern to NBIM Management and its Governing Bodies.

   b. The definition of tangible, measurable parameters to substantiate and monitor the Fund's position versus this appetite. Reporting of risk levels against the pre-defined risk appetite measures should be at least quarterly to the Supervisory Council and the Ministry.

2. NBIM Management should assume primary responsibility for setting the monitoring arrangements around Operational Risk stress scenarios. Based on the discussions we have held with Norges Bank and NBIM Senior Management, we would expect particular attention to be given to stress scenarios related to Reputation Risk and Regulatory Risk. Examples of each of these would be expected to include:

   a. *Reputation Risk* – Leading practice examples of Reputation Risk monitoring include:

      i. Watching for negative press or analyst commentaries on the operational running of the Fund.

      ii. Identifying sensitive information leaks.

      iii. Analysing any themes from leavers exit interview feedback, with respect to the operational running of the Fund.

      iv. Watching for negative reporting on the governance and performance of key outsource providers, including fund managers with delegated authority from NBIM.

   b. *Regulatory Risk* – Leading practice examples of Regulatory Risk monitoring include:

      i. Formal, at least quarterly, impact assessment of recent or forthcoming changes to regulatory rules in each regime within which NBIM operates and invests (e.g. new Money Laundering rules for a Far East market such as Hong Kong).

      ii. Formal reporting of any breaches, or near breaches, to the public notification requirements in each regime within which NBIM operates and invests (e.g. shareholder notification requirements set out by the London Stock Exchange).

3. Strong buy-in and participation from the 'First Line of Defence' is critical to delivering a leading practice Operational Risk framework. We therefore suggest a close monitoring, throughout the implementation phase and beyond, of the degree to which the new Operational Risk framework is embedded into the business lines, including in the context of new business opportunities (e.g. opening of a new office in Asia).

Operational Risk

Operational Risk: Risk Identification

Statements of Principle

The framework should include a documented methodology that defines the components of Operational Risk, the agreed terminology and risk language classifications to be used when describing the related risks identified, and the way in which accountability and ownership for risk identification, management and control is assigned.

Assessment and Observations

We have reviewed the documentation that describes the new design principles of the framework for risk identification and the proposed implementation plan. Our view is that the new design principles compare favourably against leading practice.

The population of the Operational Risk register (or 'risk database') using the new risk identification protocols, was scheduled for completion in April 2007.

Recommendation

The roll-out of the new Operational Risk framework should deliver a comprehensive risk register that captures the risks across NBIM under a common methodology, language, and risk categorisation model. Importantly, Management actions to address Operational Risks should be clearly aligned to the risks identified and captured in the risk register. We would expect the responsibility to maintain the risk register up-to-date and complete to be assigned to the Operational Risk Managers ('ORMs').

Operational Risk: Risk Assessment and Measurement

Statements of Principle

Standardised assessment and measurement parameters should be applied consistently throughout the organisation to allow a ranking of the risks according to their significance to NBIM.

Losses should be captured, assessed, and analysed so that a 'lessons learned' feedback loop is established, and the loss data can provide assurance on the accuracy of the risk and control assessments.

Assessment and Observations

We have reviewed the documentation that describes the new design principles of the framework for risk assessment and measurement, together with the proposed implementation plan. Our view is that the new design principles compare favourably against leading practice.

The risk assessment process under the new methodology will be an enhanced version of the existing approach to ensure greater consistency across EBL and FIBA.

Recommendations

1. The assessment of the risks should be carried out in a manner that ensures that the assessment criteria are consistently applied across NBIM. These assessment criteria need to be formally documented and widely communicated across EBL and FIBA.

Operational Risk

2. The process underlying the measurement and assessment of the risks should ensure that the ORMs compare risks against each other in a consistent manner across the organisation, as required by the framework and the EDG.

Operational Risk: Risk Monitoring and Management

Statements of Principle

There should be clear accountability and ownership for the monitoring and management of Operational Risks against defined risk appetite limits, documented in an approved methodology. The risk framework policy should describe the basis on which risk should be 'Taken, Treated, or Transferred' in line with the defined risk appetite limits.

Where significant activities are outsourced to a third party service provider, there should be a clearly articulated guidance on managing and monitoring the outsourced arrangements.

Appendix E shows a leading practice framework to define the Operational Risk appetite, which we discussed with NBIM Management during the project workshops.

Assessment and Observations

We have reviewed the documentation that describes the new design principles of the framework for risk monitoring and management, together with the proposed implementation plan. Our view is that the new design principles compares favourably against leading practice.

The monitoring and management of risks carried out under the new methodology will be an enhanced version of the existing approach to ensure greater consistency across EBL and FIBA. This methodology describes the criteria Management should use to 'Take, Treat, or Transfer' the risk in line with the defined risk appetite limits. We believe this guidance compares favourable against leading practice.

In addition, the risk framework policy describes the use of Key Risk Indicators ('KRIs') as an integral part of the Operational Risk monitoring process.

Recommendations

1. The implementation of the new framework needs to deliver a monitoring process whereby the actual risks assessed are readily compared against the risks appetite statements, and thereby provide the platform for quarterly reporting to NBIM Management and the relevant Governing Bodies, as required by the framework design.

2. In particular, we would expect specific reporting on the Operational Risk stress scenarios that are of most concern to the Governing Body for Operational Risk. This reporting should be at least quarterly. In the Governance section above, we have included examples of the type of monitoring and reporting we would expect to see in connection with stress scenarios associated with Reputation Risk and Regulatory Risk.

3. We recommend that the new KRI monitoring and reporting process leverages on the existing monitoring of control breaks, risk trends and risk related business metrics already carried out within EBL and FIBA.

4. The new framework should be implemented in a way that ensures that Operational Risk assessments can be leveraged upon for key decision making by NBIM Senior Management. NBIM should be able to demonstrate at any time that Operational Risk management forms an integral part of the decision making processes within the Fund.

Operational Risk

5. As noted before, the monitoring and reporting requirements for Operational Risk should include a clear definition of the escalation requirements. This definition should set out amongst others what constitutes a 'significant matter' of exception that should be reported directly to NBIM Management or to the relevant Governing Bodies.

Operational Risk: Supporting Technology

Statements of Principle

An organisation wide data depositary should be in place to facilitate the collection, aggregation, and reporting of risk, control, and loss data.

Standardised templates should be used for data collection and information gathering to help ensure consistency and completeness of risk information across the business.

Assessment and Observations

We believe that the Operational Risk framework is adequately supported by the current supporting data collection and reporting procedures.

The enhanced templates for data collection compare favourably against leading practice.

Recommendations

1. Whilst we accept that the current technology supporting the Operational Risk framework is appropriate, the growing operational burden related to the development of the Fund, such as the day-to-day monitoring and reporting of the investment universe against global compliance notification rules and requirements, suggests that the simple 'spreadsheet based' approach adopted at present will soon be insufficient. We would therefore recommend that a review is carried out to assess the scalability of the current data depository arrangements in the light of the Fund's ambitious development plan.

2. The ORMs should assess the viability of the existing Operational Risk technology support in the light of the new reporting requirements to NBIM Management and the relevant Governing Bodies, including stress scenario analysis.

Operational Risk: Risk Reporting and Management Information

Statements of Principle

Formal risk reporting should be regular and timely (at least quarterly). The format and content of the risks reports should be defined within the Operational Risk framework policy, and consistently applied across the business.

Consolidated management information should be communicated to Senior Management through clearly established escalation protocols, to guide senior management over which issues need to be escalated to the relevant Governing Bodies.

Assessment and Observations

We have reviewed the documentation that describes the new design principles of the framework for Operational Risk reporting and the proposed implementation plan. The reporting and management of risks will be carried out under the new methodology, which is an enhanced version of the existing approach to ensure greater consistency across EBL and FIBA. Our view is that the new design principles compares favourably against leading practice.

Operational Risk

In our experience, an Operational Risk framework implementation is always followed by a period of 'embedding'. During this period, Senior Management needs to become comfortable with the new Operational Risk reporting that comes with the framework.

Recommendations

1. The Operational Risk framework implementation should identify the detailed risk reporting needs of the key stakeholders, such as the relevant Governing Bodies, the business line heads of EBL and FIBA, and the respective Chief Operating Officer ('COO') of EBL and FIBA.

2. There should be periodic assessments of the content, frequency, completeness and relevance of the Operational Risk reports taking into account.

    a. The stakeholders' feedback on the extent to which the Operational Risk reporting process supports effectively their decision making processes.

    b. A 'back testing' analysis of main Operational Risk losses incurred, or mitigated due to management actions directly attributable to an interpretation of the risk reports.

Market Risk

Market Risk: Governance

Statements of Principle

Clear roles and responsibilities should be established and approved by the relevant Governing Bodies, for the identification, assessment, monitoring, reporting and management of Market Risk.

The risk framework should be clearly articulated through a risk policy document defining the principles and guiding methodology around identification, measurement, assessment, monitoring and reporting.

The 'tone from the top' should be articulated through clearly defined risk appetite limits. These limits should be described in tangible and measurable terminology such that it is clear which risks are acceptable to take, and which risks are unacceptable.

Once the risk appetite limits have been established, a clear process should be defined for regular monitoring and reporting against those limits.

Assessment and Observations

Risk appetite is formally defined in terms of a fund-wide Tracking Error target of 150 basis points versus a set of specified benchmark portfolios, and general aggregate net exposure limits to equity and fixed income exposures. Current restrictions for equity exposure range between 30% and 50%, and fixed income exposure between 50% and 70%. An additional qualitative requirement commands the diversification of investments via independent external and internal mandates as much as possible.

Based on the review of the documentation available and the representations made to us, we understand that the 'risk budget' in terms of Tracking Error is further broken down for the Beta and Alpha parts of the portfolio, as well as per individual managers. Although the Value at Risk ('VaR') measure is used extensively for risk management purposes as evident in the business groups' risk reports, it is currently not part of the official risk appetite definition and the risk reporting.

The monitoring of these limits is performed partly by the Back Office ('B/O') functions within the FIBA and EBL business lines, and partly by the RPA function. Despite the official direct reporting line of these B/O function to NBIM 's ED, we question the true independence in practice of these B/O functions from the Front Office ('F/O') based on a number of discussions with key FIBA and EBL representatives.

We also believe based on these discussions that the RPA function is at times too reliant on the B/O functions for data. For example, RPA relies on the B/O for access to data on holdings and information on terms and conditions. Also, whilst we understand that valuation data (e.g. prices, correlations) are generally sourced from RiskMetrics for Market Risk measurement purposes, some fixed income instrument prices are not independently supplied by RiskMetrics.

We also observed during our review that RPA was not optimally resourced, having recently lost a substantial number of its personnel. Although we endorse the temporary solution adopted by NBIM Management to fill the RPA vacancies with RiskMetric resources, we believe that a strategic and core control function such as RPA's should not be outsourced to an external provider. We understand that NBIM is in the process of re-building and strengthening the RPA function to address this issue.

Market Risk

Recommendations

1. Given the relative small size of the Alpha portfolio today, the Tracking Error limit set by the Ministry as the main 'Risk' limit seems to provide an appropriate guideline. Should the size of the Alpha portfolio expand in the future, we recommend that the set of risk limits be enhanced to include more granular requirements to allow for more transparency on the risks incurred. These requirements could include limits on VaR and exposure with regards to geography, rating classes, yield curve components, relevant instrument types and systematic relevant risk factors such as credit spreads and FX rates, as well as stress limits.
2. Whatever limits are defined, the integrity of the reporting against these limits should be subject to the control of a truly independent quality assurance function capable of validating the timeliness, accuracy and completeness of the information reported. We therefore recommend that the RPA function is strengthened with the appropriate mandate, number of resources and technical skill-set, in order to challenge effectively both the modelling approach and the valuation data used by the Portfolio Managers. NBIM Management should also ensure that the RPA function is fully independent from the Front Office in its access to valuation data or modelling expertise.

We believe that NBIM Management is aware of these limitations and has undertaken to re-build the RPA function. The recruiting of new risk analysts is accompanied by a number of organisational changes, including the recruiting of a new CFO (already on board) and that of a fully dedicated CRO.

Market Risk: Risk Identification

Statements of Principle

Market Risk should be clearly defined. There should be a systematic process in place to ensure all relevant Market Risks are identified and updated on a regular basis within the organisation. This process should also ensure that there is clear accountability and ownership for the identification of specific Market Risks.

Assessment and Observations

Based on our review of the documentation provided and representations made to us, we have observed a good general level of risk awareness at all levels among the people we have interviewed within GPFG. Although the risk reporting to the Executive Board and the Ministry is mainly limited to Tracking Error, FIBA and EBL (and therefore the NBIM management) benefit from extensive and detailed Market Risk reporting capabilities internally.

New products or activities are subject to a formal and extensive assessment process involving the F/O as well as all the support function and legal departments, to ensure that the appropriate infrastructure is in place before trading is authorised.

Recommendations

1. We recommend that the New Product/Activity Approval ('NPA') process be formally 'owned' by the CFO/CRO functions going forward.

2. In view of the potential for use of the entire allowed investment universe, which allows investment in riskier OTC products to support a strategy with more emphasis on active management and absolute return, the NPA should include the definition of specific sets of limits (including stress limits) tailored to this new environment.

Market Risk

Market Risk: Risk Assessment and Measurement

Statements of Principle

Standard assessment and measurement processes which consider the key drivers of Market Risk should be in place within the organisation. We would normally expect assessment methodologies to include models such as VaR, marginal VaR and Tracking Error where appropriate.

In addition, other risk factors such as 'event risk' which lead to large movements of Market Risk factors over a small time interval, 'Liquidity Risk' and 'Prepayment Risk' should be considered where appropriate.

The assessment process should also include the performance of appropriate stress testing and sensitivity analysis (e.g. consideration of the 'Greeks' for option positions) as well as back-testing of statistical assessment methodologies (e.g. VaR).

Assessment and Observations

Based on our review of the documentation provided and representations made to us, NBIM reports Market Risk externally mainly in terms of Tracking Error against a set of predefined benchmark portfolios, in accordance with the reporting requirements set out to date by the Ministry.

However, internal reports to the NBIM's ED by EBL and FIBA contain more granular information on Tracking Error composition for relative return portfolios and VaR composition for absolute return portfolios, which are closely monitored.

Given its main mandate to generate relative return, NBIM currently performs stress testing only on an ad hoc basis, whenever required by NBIM's ED or the business lines. However, business groups have the technical capability to conduct such stress tests and can use extensive scenario analyses to support the new product approval process, portfolio management, or strategic discussions on asset allocation. FIBA has documented scenario analysis capabilities under the Barra platform, which we consider to be in line with industry leading practice. However, we have not been able to confirm the range of products and positions supported by this platform.

We have also observed through our discussions that NBIM Management considers Liquidity Risk as a relatively low risk given the large diversification of the portfolio. It is therefore currently monitored and reported inconsistently across EBL and FIBA.

Recommendations

1. We recommend the implementation of a more formal and systematic stress testing framework based on pre-defined scenarios. We recommend that the Risk Management function and the F/O develop a set of relevant stress scenarios compatible with existing scenario analysis system capabilities, to assess the impact of stressful conditions on the Fund's risk profile. The stress analysis should be used among others in the context of the Fund's risk appetite definition, for example by introducing separate exposure and VaR limits under stress.
2. We appreciate that liquidity risk is a secondary concern to GPFG. Indeed, the long term nature of the fund, the steady inflow of cash and the mandate given to NBIM imply that Liquidity Risk resulting from sudden changes in strategy or 'forced sale' scenarios is relatively low. We therefore agree that the need for reporting Liquidity Risk for NBIM is less important than for more traditional types of investment managers.

However, we believe that reporting VaR numbers without any indication on the liquidity exposure of the fund is incomplete and can be misleading. VaR numbers do not contain any information on the risk of loss related to a sale of assets in illiquid markets but are designed to imply potential loss in terms of market value from a sale at the end of the risk horizon. We believe that due to its relative size in the market, the Fund is likely to incur positions large enough to cause significant price shifts in such scenarios if liquidated within the time horizon chosen for the VaR calculation. As a consequence, a VaR report can easily be misinterpreted as a ‘maximum loss’ (with the usual conditions on time horizon and confidence level) whereas realised losses in case of liquidation could be significantly higher.

We therefore recommend that Liquidity Risk information is included into the reports to the relevant Governing Bodies, including the Ministry, differentiating the liquidity risk related to the benchmark portfolio and that related to active management. We would also recommend that a note is added to the VaR number for the attention of the less-educated reader, to highlight the limitations of and assumptions behind this number.

Market Risk: Risk Monitoring and Management

Statements of Principle

There should be clear accountability and ownership for monitoring Market Risks. A clear, approved methodology should exist for monitoring all identified risks and key Market Risk drivers on an organisation-wide basis and comparison of the outcome of this monitoring to risk appetite limits.

In addition, a clear, approved methodology and process should exist for managing Market Risk across the organisation ie, to allow management to ‘Take, Treat or Transfer’ Market Risks in line with the approved risk appetite limits.

Assessment and Observations

Based on our review of the documentation provided and representations made to us, we have observed that the risk taking culture within GPFG is based on a high level of delegation to the business lines and the individual portfolio managers. This delegation is supported by documented guidelines, job descriptions and investment mandates. Risk monitoring is supported by a centralised Management Information system allowing the Chief Investment Officers (‘CIOs’) and the NBIM’s ED to monitor the risks at both aggregate and sub-portfolio levels. Risk monitoring is enhanced by a ‘hands-on’ management culture and frequent contacts between NBIM’s ED, the CIOs and the fund managers.

RPA utilizes the FIBA and EBL data warehouses as a basis for its analysis, in conjunction with the RiskMetrics server. It compiles a comprehensive view on Exposure, Tracking Error, VaR and Expected Shortfall decomposition across all aggregation levels down to the individual position. The report content is put on the NBIM intranet and updated on a monthly basis. Emails are sent from RPA to the NBIM’s CEO to inform him when the intranet is updated and ready for review. Overall aggregate fund level risk content is updated weekly. The intranet online capabilities appear in line with leading industry practice.

As a result, NBIM’s ED receives from RPA every month extensive risk reporting down to sub-portfolio level. This information is included in a monthly report to Norges Bank’s Governor.

Market Risk

Recommendations

1. Based on the size of the Fund today, its rapid growth and expansion into new products and locations, as well as the challenges presented by a rapidly increasing headcount, we recommend the establishment of clearer, more detailed definitions of Market Risk accountabilities. We note that the recently updated job descriptions and mandates for the CIOs and the COOs, as well as the new job description for the Head of RPA, are moving in the right direction. We believe however that further improvements can be made in documenting the cascade of risk management accountabilities.

2. The forecasted expansion of the Fund highlights the importance of a robust, independent and appropriately skilled RPA function to ensure the integrity of the Market Risk monitoring process and continuous quality in the management of the Fund. As previously stated, we therefore recommend that the RPA function is re-built and strengthened as soon as possible, with the appropriate mandate, number of resources and technical skill-set.

Market Risk: Supporting Technology

Statements of Principle

Systems should exist for Market Risk measurement, monitoring and reporting, including Profit & Loss calculation. These should include appropriate systems for position keeping, market data storage and reference data maintenance, as well as calculation engines and feeder systems for both market and position data.

Assessment and Observations

We have not performed an audit of the Information Technology platform supporting NBIM's asset and risk management activities. Our observations are based on our understanding of this platform through several presentations and the Management Information reports made available to us during the course of our review.

The technology platform presented to us seems to be robust, secure and scaleable. The data architecture together with the risk measurement and aggregation functionalities appear in line with industry leading practice, allowing a timely and centralised monitoring of risk exposures.

Recommendations

Subject to the existence of an appropriate process to ensure IT security and the integrity of the reporting process, we do not have significant recommendations at this stage.

Market Risk: Risk Reporting and Management Information

Statements of Principle

Formal risk reporting should be regular and timely. The format and content of the risks reports should be defined within the Market Risk framework policy, and consistently applied across the business.

Consolidated management information should be communicated to Senior Management through clearly established escalation protocols, to help Senior Management identify which issues need to be escalated to the relevant Governing Bodies.

Market Risk

Assessment and Observations

As described earlier, NBIM benefits from extensive and detailed Risk Management Information. However, based on our review of the documentation provided to us, we have observed that only a small portion of the total information is reported beyond Norges Bank Management, since current reporting requirements from the Ministry are limited to information on the Tracking Error at portfolio level only.

Within NBIM, business line performance and risk information is collected within the business lines and formally reported by RPA to NBIM's ED on a monthly basis. We understand that in addition to this written monthly report, the head of RPA meets with NBIM's CEO regularly to informally discuss changes at individual portfolio level and general events which RPA considers to have a substantial impact on the Fund's Market Risk position. This risk information seems to provide a detailed and comprehensive view on exposures and VaR contributions across the portfolios, in line with leading industry practice.

Recommendations

1. We recommend that the formal requirements for RPA risk reports are enhanced to ensure that they reflect the level of reporting required to provide NBIM's ED with an independent perspective on the Fund's current risk profile and outlook.

2. Should the expanded use of the full allowed investment universe include assets for which indices are either not available or do not provide a meaningful benchmark, we recommend enhancing the set of risk parameters reported to the Ministry. This could be done by including information on Expected Shortfall or VaR information for all portfolios. This would provide the investor with a more meaningful analysis of the absolute, risk adjusted performance. Dependent on the complexity of such (exotic) products, reporting should also include information on utilisation of specific risk and stress limits.

Section 5

Credit Risk

Credit Risk: Governance

Statements of Principle

Clear roles and responsibilities should be established and approved by the relevant Governing Bodies, for the identification, assessment, monitoring, reporting and management of Credit Risk.

The risk framework should be clearly articulated through a risk policy document defining the principles and guiding methodology around identification, measurement, assessment, monitoring and reporting.

The ‘tone from the top’ should be articulated through clearly defined risk appetite limits. These limits should be described in tangible and measurable terminology such that it is clear which risks are acceptable to take, and which risks are unacceptable.

Once the risk appetite limits have been established, a clear process should be defined for regular monitoring and reporting against those limits.

Elements of credit risk should be clearly defined and identified at a transactional, counterparty and portfolio level. This includes definitions around the credit risk arising from holding credit risky assets such as bonds (“lending risk”) and the risk of suffering losses due to credit events at counterparties of derivative transactions when these derivatives are in-the-money (‘Counterparty Credit Risk’ or ‘CCR’).

Assessment and Observations

Based on our review of the documentation provided and representations made to us, responsibility for Credit Risk measurement is outlined within the Executive Director’s Guidelines (‘EDG’). This document defines general guidelines on minimum credit requirements and CCR.

Exposure limits are established at the Fund level for all counterparties and allocated to FIBA and EBL. Responsibility for the monitoring of these guidelines is assigned to the RPA function.

Given NBIM’s current mandate and Tracking Error target, we believe that the Credit Risk guidelines in place are adequate.

Leading industry practice risk measurement and risk reporting requires the clear definition of a glossary of key Credit Risk terms (e.g. ‘Exposure’, ‘Loss’, ‘Default’). Such definitions should cover all technical aspects of measurement such as calculation rules for exposures and limit utilisation, portfolio risk measure definitions such as Credit VaR, concentration risk and incurred losses. The EDG currently does not provide a comprehensive glossary of these terms.

The current set of definitions only includes references to credit events for Credit Default Swaps (‘CDS’) contracts and defines counterparty limits and exposure in terms of ‘mark-to-market plus add on’. ‘Probability of Default’, ‘loss’, ‘recoveries’ (for the existing securities lending business or bond holdings, for example) and portfolio risk measures such as ‘Credit VaR’ are currently not used.

Recommendations

1. We recommend a more comprehensive definition of the Credit Risk terminology within the EDG.

Credit Risk

2. Should NBIM increase its use of the allowed investment universe to include greater absolute return strategies resulting in substantial Issuer Credit Risk in addition to current CCR exposure, the set of definitions should be enhanced to allow for identification, measurement and management of Credit Risk:

    a. The minimum set should contain definitions for counterparty default probability (PD), expected recovery in event of a default (or, equivalently, expected loss given default) as well as exposure at default.

    b. Furthermore we recommend the adoption of an absolute risk measure such as expected shortfall or Credit VaR for portfolio Credit Risk. It should be noted that the investment universe for which a meaningful benchmark exists is only a subset of the full authorised investment universe. For those investments with no benchmark, alternative risk measures should be used.

    c. We recommend that the overall set of risk definitions include constraints on stressed numbers. RPA should develop a set of relevant stress scenarios so as to be able to include stress testing results in periodic reports.

Credit Risk: Risk Identification

Statements of Principle

CCR should be clearly defined and identified at transactional, counterparty, and portfolio levels. The organisation should also have in place clearly established processes for approving new transactions in line with approved risk policy, risk appetite limits and more detailed counterparty exposure limits.

Assessment and Observations

Based on our review of the documentation provided, we have observed that the EDG spells out acceptance criteria for proposed transactions. As a rule, a position will only be accepted if it carries a credit rating from at least one of three external credit rating agencies. Such an approach is prudent and constitutes good industry practice.

Recommendations

We do not have further recommendations related to this section.

Credit Risk: Risk Assessment and Measurement

Statements of Principle

The organisation should employ a consistent methodology to measure CCR components. This should include the use of an approved rating system. A standard documented and approved methodology and process should also exist for estimating the Credit Risk relating to an organisation’s total aggregate exposure (portfolio level).

At the transaction, counterparty and portfolio level, the organisation should take into consideration potential extreme future changes in prices and other economic conditions when assessing individual credit exposures and portfolios, and should assess their Credit Risk exposures under stress conditions.

Credit Risk

Assessment and Observations

Based on our review of the documentation provided and representations made to us, we have observed that Credit Risk measurement is integrated into the existing RiskManager methodology, which is in line with good industry practice given the current investment mandate. It is worth stressing, however, that the VaR estimates derived through this methodology ignore potential default of borrowers; the value of the risk is solely driven by changes in the credit spread. The use of this approach is therefore generally limited to liquid investments with short holding periods. For investments less liquid or held over a longer term, leading practice requires the use of credit portfolio models and specific Credit VaR measures. Such a Credit VaR model is currently used by the FIBA business unit for the purpose of bond selection in the enhanced indexing process.

Current exposure, limits and limit utilisation measures are based on mark-to-market values with a product specific add-on which is static in nature. The Potential Future Exposure (‘PFE’) is currently not considered in VaR and Tracking Error calculations. For portfolios of instruments which are ‘linear’ in a sense that their value changes in a constant proportion to the underlying risk factors, this approach is sufficient.

However, it is standard practice to measure exposure from ‘non-linear’ instruments such as derivatives with complex payoff functions on a potential future value basis, in order to capture the risk that exposure will increase substantially in certain market conditions. CDS’ provide an example for the combined Market and Credit Risk effects: A buyer of a CDS incurs potential future exposure against the counterparty in all market constellations where the contract has positive market value, i.e. where the credit spread of the reference asset exceeds the spread at the time the CDS was bought. Consequently, the seller of the CDS incurs CCR where the reference asset spread drops below strike level. However, in addition to the counterparty risk, the seller incurs credit exposure of the notional amount less the market value of the reference asset at time of default against the reference party of the contact. Neither of the two exposure categories is captured in a mark-to-market measure of exposure.

CCR is restricted to the exposure that is faced through holding unsecured Credit Risk across a range of derivative, deposits and securities lending. Credit Risk across all positions, including Issuer Credit Risk, is currently not captured or aggregated, which is not in line with industry leading practice. We understand that the RPA function is currently addressing this issue in an ongoing project which aims to implement a full EPE/PFE model using RiskManager.

Recommendations

1. We recommend a more systematic use of credit portfolio models and specific Credit VaR measures for investments that are illiquid or held over a long period of time.

2. Should the use of the allowed investment universe increase to include the use of non-linear instruments such as derivatives, credit derivatives as well as credit risky securities, we recommend that the current mark-to-market plus add on approach to exposure measurement be replaced by a robust quantitative PFE model, in line with leading industry practice. We therefore endorse the efforts undertaken by GPFG to that effect.

3. In recognition of the fact that Credit VaR numbers derived from models have in the past proven inadequate in times of crisis, stress testing is becoming a standard industry practice tool for Credit Risk management. Currently, FIBA is utilising stress scenarios and credit stress loss limits for portfolio management. We recommend that a formal set of pre-defined and approved stress scenarios are applied across both EBL and FIBA.

Credit Risk

Credit Risk: Risk Monitoring and Management

Statements of Principle

There should be clear accountability and ownership for monitoring Credit Risks. A clear, approved methodology should exist for monitoring all identified risks on an organisation-wide basis against risk appetite limits.

In addition, a clear, approved methodology and process should exist for 'managing' Credit Risk across the organisation to allow management to 'Take, Treat or Transfer' Credit Risks in line with the approved risk appetite limits.

Assessment and Observations

Based on our review of the documentation provided and representations made to us, we have observed that exposures against credit limits are monitored daily by the RPA function, on a spreadsheet using the 'mark-to-market plus add on' measure. NBIM is also in the process of implementing RiskMetrics' Credit Exposure module within the RiskManager application. This will allow future monitoring of PFE, and therefore a more accurate and robust management of the credit exposure.

Recommendations

We endorse the implementation of a more secure and sophisticated technology platform leveraging on RiskMetrics' functionalities, within the nearest possible future.

Credit Risk: Supporting Technology

Statements of Principle

In order to administer efficiently its portfolio, the organisation should have information systems and analytical techniques that enable its management to effectively measure all dimensions of Counterparty and Concentration Risks.

Assessment and Observations

We have not performed an audit of the Information Technology platform supporting NBIM's asset and risk management activities. Our observations are based on our understanding of this platform through several presentations and the extensive Management Information reports made available to us during the course of our review.

As mentioned in the Market Risk section, the overall technology platform appears robust, secure, and scaleable. The range of functionalities available for Credit Risk measurement and monitoring is however currently much more limited than that available for Market Risk.

Recommendations

We recommend the enhancement of the credit monitoring functionalities currently available and endorse NBIM's continuous efforts to leverage fully on its technology platform.

Credit Risk

Credit Risk: Risk Reporting and Management Information

Statements of Principle

Formal risk reporting should be regular and timely. The format and content of the risks reports should be defined within the Credit Risk framework policy, and consistently applied across the business.

Consolidated management information should be communicated to Senior Management through clearly established escalation protocols, to help Senior Management identify which issues need to be escalated to the relevant Governing Bodies.

Assessment and Observations

Based on our review of the documentation provided and representations made to us, we have observed that no reports are currently produced showing aggregate credit exposure and rating structure, credit concentration risk or migration events in the portfolio.

Recommendations

Should NBIM’s use of the allowed investment universe increase, the sophistication of the management information around Credit Risk should be enhanced to include:

1. Information on obligor ratings migration and changes in PD or recovery information.
2. Individual and aggregate PFE segmented along counterparties, products, regions and industries.
3. Portfolio concentration information in terms of ratings and portfolio risk measures such as Credit VaR and Expected Shortfall.

We stress that the quality of this information would be subject to the integrity of the reporting process and the existence of an independent quality assurance function (e.g. RPA) to ensure the accuracy, timeliness and completeness of the information.

Performance and Valuation

Statements of Principle

The organisation should only use price sources that are fair, accurate, and compliant with regulation. Clear definition should exist around suitability and appropriateness of price sources (including consideration of these for new instruments) and well defined and approved procedures should exist to identify unexpected price movements.

Sourcing and validation of security prices should be undertaken by an operational function with reporting lines that are entirely independent from the Front Office.

Assessment and Observations

We have discussed with management the valuation procedures currently followed by NBIM. We stress however that we did not perform any quantitative or qualitative audit of the information provided to us.

Based on our discussions, we have observed that the majority of prices used for valuation purposes seem subject to a satisfactory independent validation process by RPA, through a monthly reconciliation against information provided by fund custodians. We have reviewed the documentation that describes the process and activities for making use of external price sources for equities and fixed income securities. Both EBL and FIBA make use of a single data warehouse in order to ensure consistent application of pricing data across all funds. In setting the prices, the EDG clearly sets out the procedures for using multiple pricing source hierarchies, with a designated primary source. We believe these processes and procedures compare favourably against leading industry practice.

However, in the case of some advanced products (e.g. Mortgage Backed Securities) the models used by the fund managers to value these products do not appear to undergo robust independent validation. When independent market prices are not available, the EDG allows for internal valuation methods to be applied.

We understand that RPA is required to spot-tests valuations at month end. However at the time of our review this unit did not seem to have the full knowledge required to test the valuation of complex products, such as complex fixed income derivatives.

Recommendations

1. We recommend a more granular description and documentation of the procedures and protocols to value securities and investments for which no market price is available from an external source. The new protocols should include clear guidance and examples of valuation methodologies for non-linear instruments, in order to ensure a consistent application of the guidelines across the EBL and FIBA business lines. This should provide more transparency in the valuation process and ensure that a systematic, independent validation of all prices and valuations feeding the management reporting system.

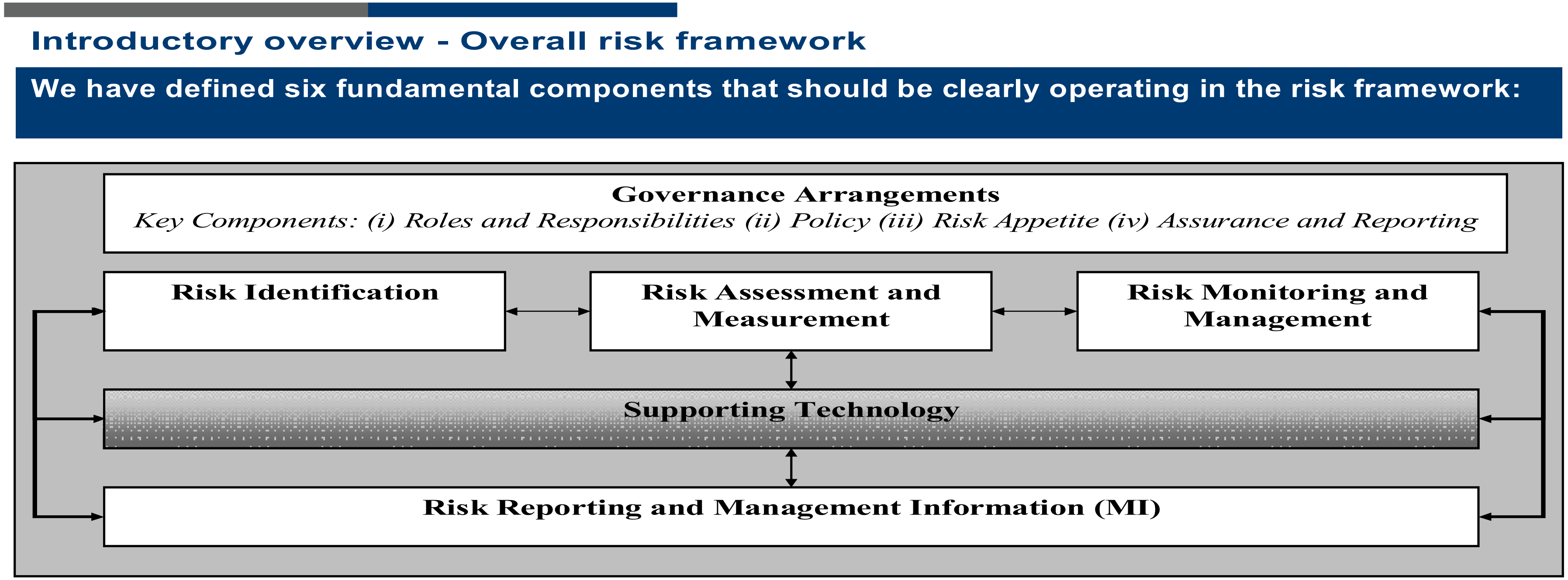
2. In conjunction with the recommendation above, we refer to previous comments on the role, resourcing and profile of the RPA function. We believe that this function should be strengthened so that it has the capabilities to challenge effectively the model designs and assumptions used to value products which do not have a publicly available price. As mentioned earlier, we believe that NBIM is aware of the current limitations of the RPA function and has initiated a series of projects to address them.

3. NBIM Management might want to consider more systematic intra-month valuations for selected material exposures.

APPENDICES

Appendix A

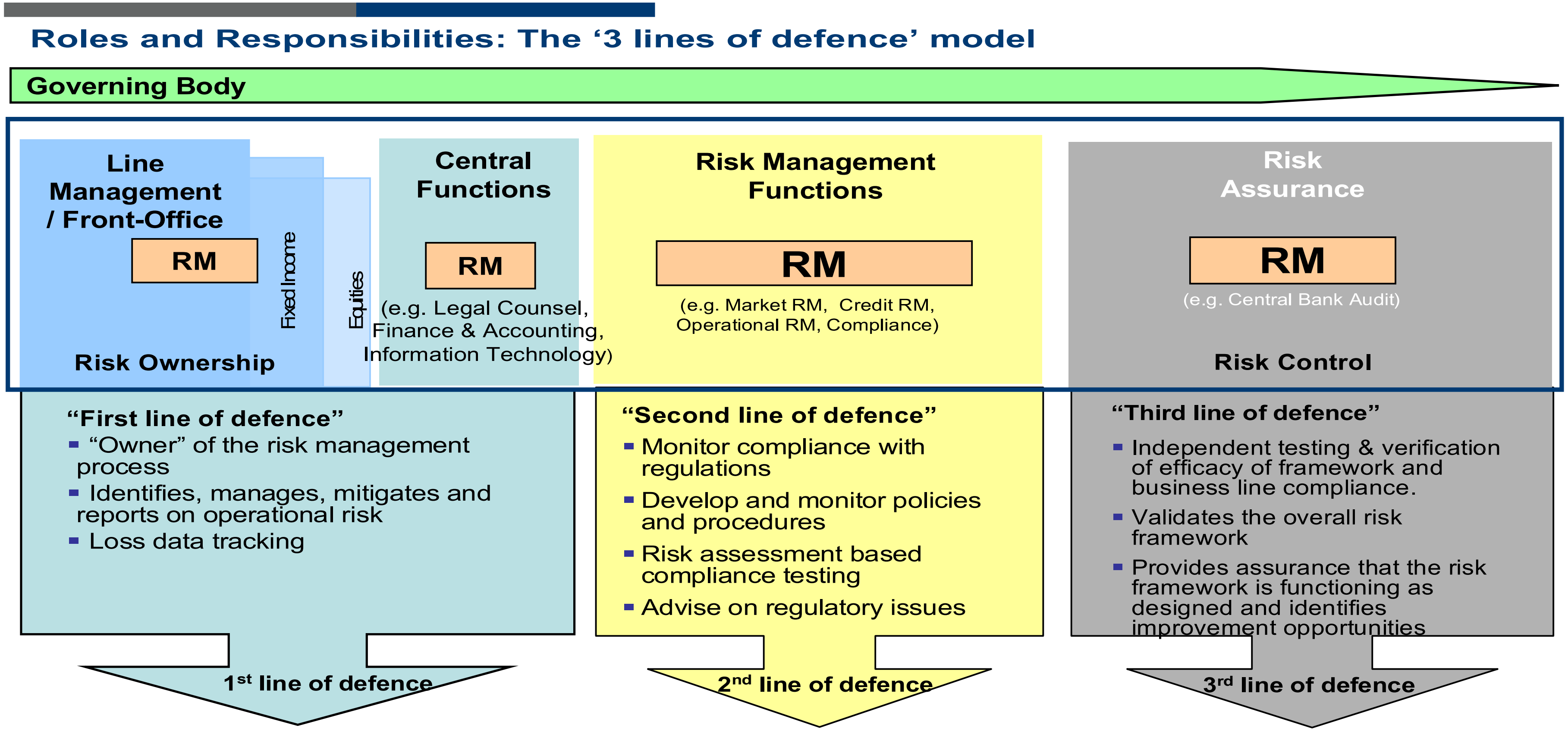
Diagram referred to in the Report – Figure 1



Although included for completeness in our questionnaire, we will not directly address Supporting Technology in these workshops. We believe technology facilitates 'good' risk identification, assessment, measurement, monitoring and management and hence 'good' Supporting Technology will occur as part of proper addressing of these other components of the risk framework.

Appendix B

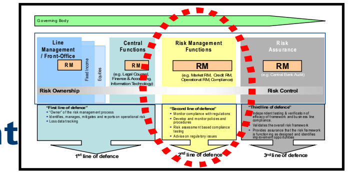
Diagram referred to in the Report – Figure 2



Appendix C

Diagram referred to in the Report – Figure 3

Roles and Responsibilities: The '2nd line of defence' – Risk Management



Shown below is an industry representation of typical key activities of the central Risk Management Function:

Risk Management Function
- Operational Risk
- Market Risk
- Credit Risk
- Regulatory Risk

Risk Policies
- Develop and maintain, for approval by Board

Risk Framework
- Develop
- Implement
- Facilitate

Risk Assessment
- Self assessment
- Reporting
- Actions

Loss Events
- Build process
- Collect events
- Analyse
- Assess actions

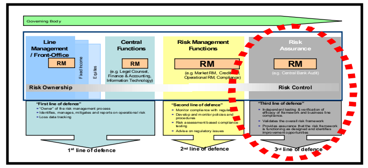
Monitoring
- Key Controls
- Mandates
- Reconciliations
- Outsourcing

Communication and Training

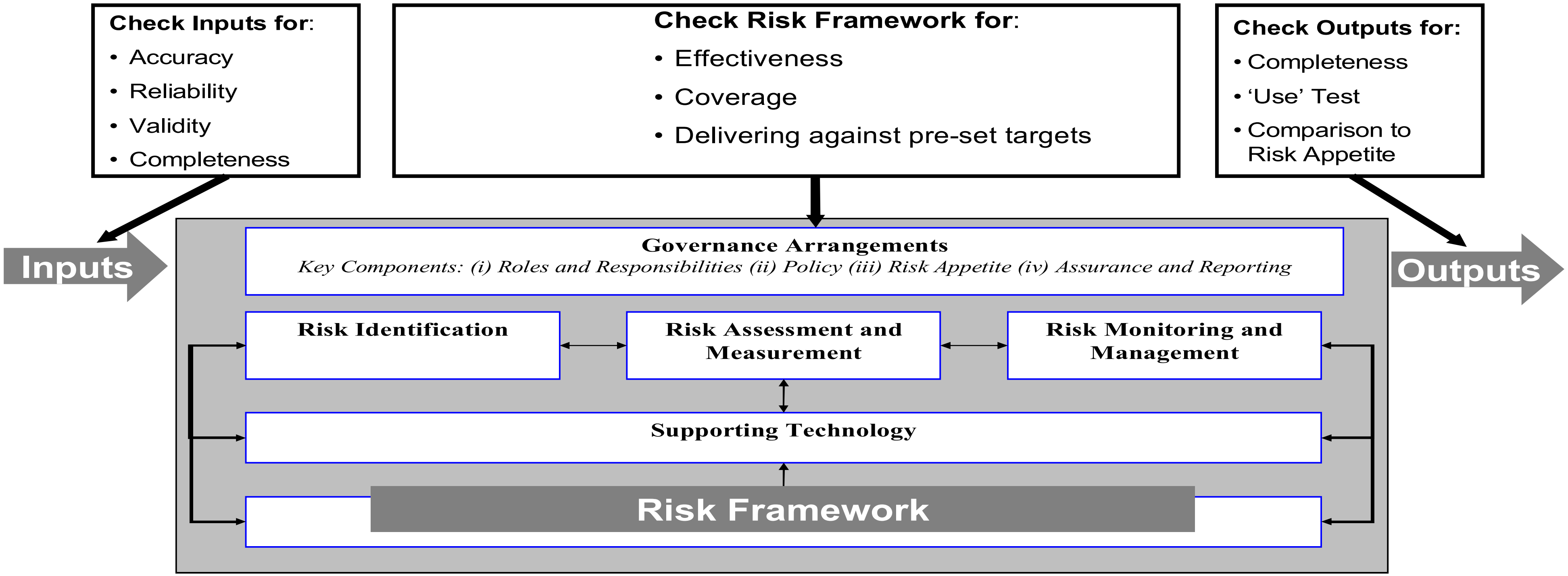
Best Practice dictates that the central Risk Management function should be independent from Line Management but closely engaged with the organisation's business functions to drive change.

Appendix D

Diagram referred to in the Report – Figure 4



Roles and Responsibilities: The ‘3rd line of defence’ – Risk Assurance



Appendix E

Diagram referred to in the Report – Figure 5

Governance: Operational risk appetite

Characteristics of a well-defined Operational Risk appetite:

"Risk Appetite defines the level and nature of risks to which the board considers it is acceptable to expose the firm. It therefore defines the boundaries of activity that the board intends for the firm. It is an essential component of risk frameworks." (FSA, November 2006)

- The Risk Appetite of a company can be explained by fitting it into a simple matrix. How does the Governing Body want to deal with certain risk? Risk can generally be scaled along the axes **Frequency** and **Impact**.
- In order to fit risks into these categories, events occurring as results of these risks have to be **measured**.
- With the **proper information**, a Governing body should be able to **define a set of risks** that the company is willing to **accept** or **deal with**.