Private and Confidential

Lehman Brothers

ICAAP Supporting Document:

Operational Risk Management Overview

May 2008

FOIA CONFIDENTIAL TREATMENT REQUESTED BY
LEHMAN BROTHERS HOLDINGS INC.

LBEX-DOCID 384019

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1. Operational Risk Management

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1. Operational Risk Management

1.1 Operational Risk Management Overview

Operational Risk Management is an independent risk management department within Global Risk Management Division ("GRMD"), and reports directly to the Chief Risk Officer based in New York. The other departments in the division are:

- Credit Risk Management
- Market Risk Management;
- Sovereign Risk Management;
- Investment Management Division Risk Management;
- Quantitative Risk Management;
- Principal Investment Risk Management; and
- Risk Information and Analysis Department.

The Quantitative Risk Management department also contains Operational Risk Analytics (ORA), which provides modelling and analytical expertise to the Operational Risk Management department.

These departments all report directly to the Chief Risk Officer who is a member of the Management Committee and in turn reports to the Chief Administrative Officer, a member of the Executive Committee. The Chief Administrative Officer and the Executive Committee ultimately report to the Board of Directors of Lehman Brothers Holdings Inc ("the Firm", including subsidiaries).

ORM is sited primarily in three locations; New York, London and Tokyo. It has further representation in other offices worldwide where the presence of operational risk expertise is deemed appropriate.

The Board and senior management of the Firm believe that the management of operational risk is best undertaken through a "hub-and-spoke" approach:

- a global framework continuously maintained and updated by ORM;
  - in the light of internal developments (e.g. improvements in the risk management environment, changes in the organizational structure) and external developments (e.g. changes to the supervisory regime); and
- the devolution of responsibility to the business areas and support functions for local management and reporting of operational risks within those areas;
  - this is implicitly linked to the responsibility for ongoing liaison so that ORM can provide a Firm-wide perspective.

The Board has recognized that the delegation of day-to-day risk management duties and responsibilities for this risk type to appropriately qualified and skilled personnel within ORM is critical to the effective and ongoing management of the operational risk profile of the Firm. This is tied to more general oversight of the framework by senior management outside ORM, both within GRMD and in other central support functions such as Compliance and Audit.

This approach necessitates the presence of appropriate expertise and resource within ORM and its frequent and regular liaison with senior management throughout the Firm. Just as critical is the ongoing role of ORM in educating and training all personnel throughout the Firm on the topic of operational risk, promoting awareness of their responsibilities in reporting and recording relevant events, and managing it on a local basis.

1.2 Governance

The operational risk framework has been approved by the Board of Directors of the Firm, and it is reviewed on an annual basis by that body. Senior management within the Firm has been charged by the Board with the implementation of the framework throughout the Firm, across all geographic locations and all material business lines. It is the responsibility of ORM to consider any and all changes to the framework that make it more risk-sensitive and a better tool for management of this risk type, and develop proposals for consideration by senior management. Senior management then evaluates these proposals, taking into consideration the associated benefits and costs, and proposes any significant changes in the framework that have a net positive benefit for the Firm to the Board for approval. (A positive benefit is not defined solely in monetary or capital terms: a proposal where senior management believe that a generally unquantifiable benefit is available, e.g. through better protection of the reputation of the Firm, will be pursued.)

An exception to the annual review process exists, however, where there is any material change in the methodology that significantly alters the existing, and previously Board-approved, framework: in that instance the proposal(s) developed by ORM will be considered and escalated for approval by the Board as necessary.

At the level of senior executive management, ORM is represented by the Chief Risk Officer on each of the three committees listed immediately below. Activities across the Firm are considered within the scope of the first two committees, in the context of the Firm both as a consolidated entity and its specific local operations, and both regionally and globally (as necessary) by the various sub-committees involved in new product approval.

1.2.1 Operating Exposures Committee

The Operating Exposures Committee ("OEC") is chaired by the Firm's Chief Legal Officer who reports directly to the Chief Executive Officer. The OEC comprises members of the Executive Committee and other senior managers from the support/control functions and business divisions.

The mandate of this committee is to identify and address, in a holistic and coordinated manner, the operating risks inherent in the Firm's business activity. Specifically, its responsibility is to:

- protect the franchise and make sure the Firm has the right set of controls and to address key risk and exposure areas impacting the Firm;
- examine activities where the Firm has the following potential risks - market, credit, operational, technology, legal, regulatory, documentation, tax, financial, capital and reputational; and

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- identify and act proactively to get ahead of the curve in addressing those areas and issues that leave the Firm most vulnerable to the above risk types and to sponsor appropriate measures to deal with them.

1.2.2 Risk Committee

The Risk Committee meets weekly and serves as a forum for the senior management of the Firm to review all material risk exposures, and it consists of the Executive Committee, the Chief Risk Officer and the Chief Financial Officer. The mandate of the Committee includes discussion and analysis of the Firm's significant credit, market and other risks, including operational risk. The key focuses of this committee are:

- risk appetite (under development for operational risk, see section 1.5 below);
- VaR;
- counterparty credit risk - by region, product, sector, internal rating, and name (both investment and non-investment grade)
- large exposures - across ratings (investment grade, non-investment grade) and type of exposure (principal transactions, workouts and equities);
- commitments – through syndication and pipeline transactions;
- firm relationship loans (whether new or significant ones coming up for renewal); and
- other topics of interest as identified by the Chief Risk Officer.

1.2.3 New Products Committee

The New Products Committee ("NPC") is an umbrella term for three distinct, regional committees covering the Americas, Europe and Asia, which represent the governance structure and control mechanism for reviewing and approving new products or businesses in their respective regions. They function with a common objective, the definition of new products being identical across the committees, and work in conjunction with one another and with other regional and global committees of the Firm, as appropriate. (It should be noted that different protocols with respect to operational policies and procedures for the regional committees are permissible.)

The NPC in the US is chaired by the Chief Legal Officer of the Firm, and the regional chairs are senior managers drawn from various support functions (e.g. Legal, Finance); the NPC in the US also acts as a liaison among the NPC committees as necessary. The membership of the regional NPCs comprises senior managers representing Operations, Risk Management, Information Technology, Corporate Strategy, Financial Controls, Product Controls, Treasury, Tax, Legal, Compliance, Internal Audit, Transaction Management, as well as representatives from the businesses, both those presenting the proposals and others.

The duties and responsibilities of the NPCs, common across all regions, is to:

- assess the potential risks of new products or businesses to the Firm (including market, credit, operational, technology, legal, regulatory, documentation, tax, financial, capital and reputational risks);

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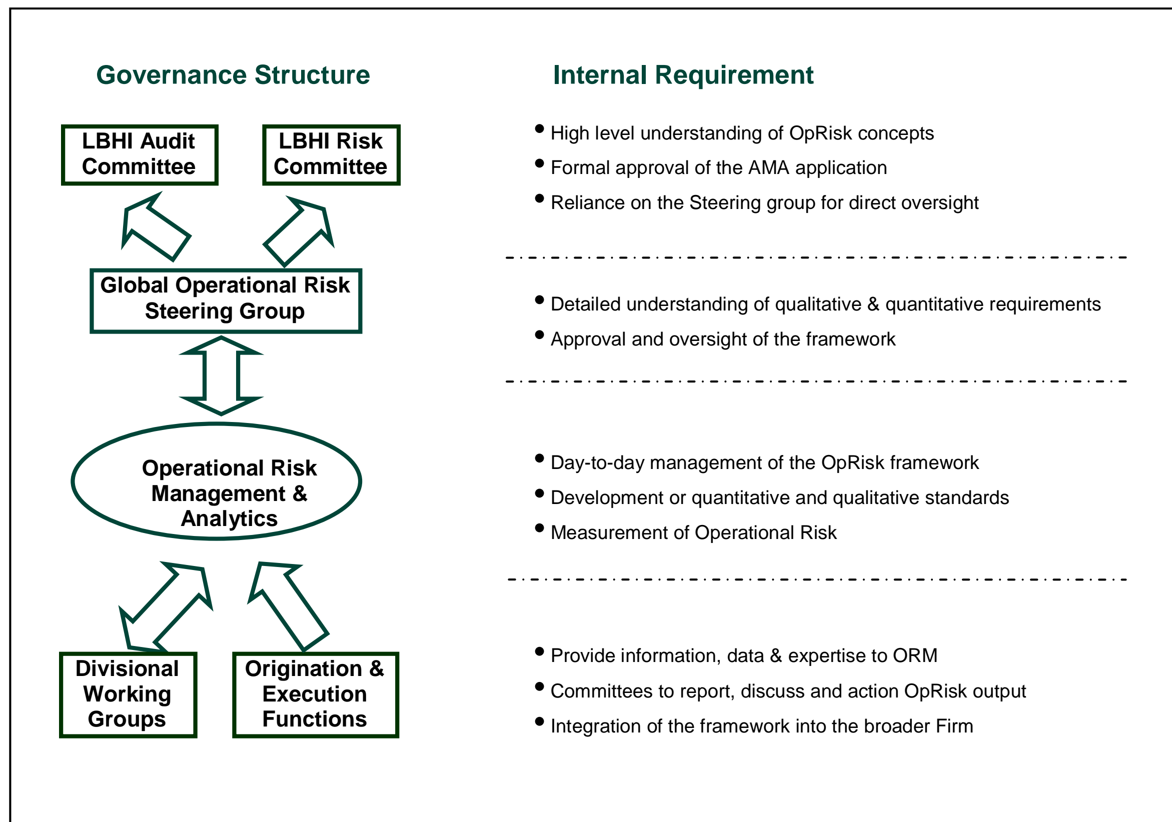
- ensure that appropriate infrastructure, including internal controls, is in place for new products or businesses; and
- approve or turn down the proposal and/or recommend enhancements related to managing the risks of such new products or businesses.

ORM has full membership of each of the regional NPCs.

1.2.4 Responsibilities

The different functions and levels of management within the Firm have differing remits and associated responsibilities in relation to the management of operational risk, and these can be represented schematically as below.



1.3 Departmental Structure

1.3.1 Operational Risk Management

The overarching objective of Operational Risk Management (ORM) is to identify, measure and manage operational risks on a Firm-wide, global basis. The management of the operational risk profile of the Firm must be as comprehensive as possible, across all regions and material activities, and must reflect not only the operational risk evinced by the more tangible aspects (internal losses), but also through the evaluation of the risk profile of the Firm in the current business environment and on a forward-looking basis.

More specifically, the key objectives and responsibilities of ORM are to:

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- implement a comprehensive and effective operational risk management framework Firm-wide, including development and maintenance of policies, procedures and an analytical model;
- raise awareness of operational risk throughout the Firm, and update senior management in light of internal and external developments;
- refine risk reporting, both formal and informal, in order to monitor operational risks;
- keep regional and global senior management fully informed of the risk profile, through formal periodic risk reporting as well as through verbal and electronic communications;
- escalate material operational risk events to senior management wherever they happen, and contribute to the resolution of these events;
- evaluate the operational risks associated with any new products through involvement and participation in the local New Products Committees and other similar bodies, and seek to reduce/mitigate these risks;
- support the global effort within GRMD and the Firm more widely in building a consolidated risk management system;
- determine the economic and regulatory capital requirements associated with operational risk[1];
- maintain ongoing and regular contact with the relevant supervisory authorities, in the US and in the regional offices, in order to keep abreast of regulatory developments; and
- contribute to industry feedback to regulatory initiatives, both bilaterally and through trade bodies, and interact with other relevant external organizations as appropriate (rating agencies, investors, etc.).

Fundamental to sound operational risk management is the establishment of a set of integrated risk management activities. ORM identifies potential areas of operational risk and develops risk assessment tools as well as techniques for monitoring the Firm's risk exposures in conjunction with Operational Risk Analytics (see 1.3.3 below). In addition, ORM collaborates with business areas to evaluate, control and mitigate potential future operational risks in existing and future products (e.g. through membership of the various new product approval bodies).

1.3.2 External Obligations

In addition to the internal role that ORM performs, it also provides appropriate expertise and information for the Firm's interactions with external bodies, primarily supervisors. (There may also be other external stakeholders, e.g. shareholders, rating agencies and the market more generally, and ORM fulfils the same role here.) It is recognised, however, that supervisors in different jurisdictions may have differing

[1] The calculation of economic capital will form a critical input to the determination of regulatory capital for operational risk when the Firm adopts an Advanced Measurement Approach as outlined in the revision of the Basel Accord

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requirements in terms of local practices to be observed, reporting requirements etc. and specific local instances of these have been identified.

1.3.3 Operational Risk Analytics

Operational Risk Analytics (ORA) is within Quantitative Risk Management. ORA is responsible for the development, implementation and ongoing monitoring and maintenance of the Firm's operational risk exposure methodologies and models. Methodologies are developed in consultation with Operational Risk Management, and systems are implemented and maintained in partnership with Operational Risk Technology.

Methodologies include the assessment of potential future risk exposure levels and exposure stress testing.

The main responsibilities are:

- research & specification of new exposure methodologies;
- user acceptance testing of new exposure analytics;
- maintenance and enhancement of the existing exposure models and their associated parameters and calibrations;
- ongoing monitoring of the performance of the exposure models;
- exposure model documentation.

1.3.4 Operational Risk Technology

Credit IT are part of Risk IT and are responsible for the in-house design, build, deployment and maintenance of credit IT applications used by CRM, CRC, CRR and QRM, and the associated data storage. Certain exposure calculations based on historical simulation use applications owned by Market Risk IT which is also part of Risk IT.

CRMC has implemented a Guidelines & Procedures document to govern the IT process for projects covering both trade exposure measurement (e.g. potential exposure) and static data (e.g. internal ratings) systems, which:

- requires all major IT projects to be recorded via a Business Requirements Document (“BRD”) or JIRA ticket (a small enhancement tracking tool); BRDs are written by the user group, for example CRM, and used for projects deemed material from an IT resourcing perspective; once completed by the user, scoped by Credit IT and an effort estimate produced, the CRMC reviews the BRD to authorize the project; JIRA tickets are used for smaller IT projects such as bug fixes and minor enhancements;
- tracks the progress of projects through the weekly Credit IT meeting forum to ensure that all project issues are aired;
- defines the user acceptance testing (“UAT”) process to ensure that the appropriate IT and business users have tested the functionality and signed-off on the changes; UAT for exposure measurement changes is coordinated by CRR and UAT for static data changes is coordinated by CRC, and any changes that are deemed to have a material impact on CRM are routed via CRMC for approval ahead of release; and

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- requires all releases to be accompanied by a release ticket with the appropriate signatories and by release notes.

Additional controls are implemented by the Model Validation Group for projects requiring change in exposure measurement analytics.

The Risk IT department adheres to Lehman Brothers' standards for day-to-day systems and data governance including, inter alia, access rights, data management, data security and business continuity planning. With the exception of making use of offshore consultants during the build phase of IT Applications, Lehman Brothers does not outsource any of its credit risk functions.

1.4 Audit Department

Audit provides senior management and the Audit Committee of the Board of Directors with an independent assessment of Lehman Brothers' internal control environment. This is accomplished by performing audit reviews on a cyclical and risk basis across all global businesses and products and supporting infrastructure.

Risk Management is included in Audit's scope, and regular cycle or risk-based reviews are performed across the Risk Management Division covering governance, operating procedures, completeness and accuracy of data capture, model methodology, and management reporting. In its reviews of the Firm's operational risk systems, Audit assesses:

- governance, including day to day supervision, policy enforcement and the roles of ORM and management in that respect;
- completeness, accuracy and accessibility of documentation relating to the design and operational details of the systems used;
- adequacy of technology, including logical access and change management controls; and
- model development, validation, usage and governance.

1.5 Risk Appetite

In calculating our overall risk appetite, our goal is to maintain a minimally acceptable ROTE and compensation adequacy including maintaining sufficient headcount to protect the franchise for the long-term.

The Firm is currently developing a risk appetite framework for operational risk, with the goal of using it to encourage business managers to take decisions that benefit the Firm as a whole and drive appropriate behaviours locally. There is a requirement that the resulting framework is consistent with the frameworks that exist for credit, market risk and other risk types so that a holistic picture of the Firm's risk appetite can be derived.

The overall risk limit is driven by Risk Appetite which is approved by the Executive Committee on an annual basis and is reviewed quarterly for requisite changes.

2. Operational Risk Measurement

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2. Operational Risk Measurement

2.1 Current Capital Calculation – Basic Indicator Approach

2.1.1 Background

The Firm currently uses the Basic Indicator Approach (BIA) to calculate a "Pillar 1" capital requirement, which in turn is assessed to determine its adequacy in light of both the Firm's overall operational risk profile and the business and control environment in which it is operating. The BIA requires the Firm to determine this capital requirement as 15% of the three-year average of the sum of the net interest income and the net non-interest income (subject to certain conditions on negative income, outsourcing, provisions, availability of data etc.). The Firm's internal management accounting categories that feature in each of these two categories and their mapping to the Basel categories are:

Basel Category	LB Accounting Category
Net Interest Income	Same
Net Non-Interest Income	Operating Income

Need to understand how the Risk Equity calculation of operational risk is undertaken – it may not be conservative when we are in a contracting environment, i.e. current year revenues are declining vis-à-vis year 1 of the existing three –year average. Might in this case be prudent to base Risk Equity calculation for operational risk on, for the current year (effectively year 4) in combination with years 2 and 3:

Year 4 = max(year 1, max (budgeted, actuals))

Need

Although the current requirements for the Firm as a CSE call for the calculation of the BIA capital requirement based on the average of the previous three years' positive annual gross income, the Firm is proactive intra-year in incorporating changes in the income stream into the calculation of the internal capital requirement. This is achieved by using a combination of:

(i) the audited figures from the previous two years; and

(ii) for the current year, the higher of actual or budgeted figures (see section 2.2 on the Risk Equity calculation).

This is conservative in nature and ensures that the Firm is able to monitor and manage the capital requirement under the BIA on a more timely basis.

2.2 Risk Equity Capital Calculation

The Risk Equity calculation is undertaken centrally and has been used as a planning tool by the Firm for a period of time. For operational risk it is based on a modified Basic Indicator Approach, that reflects the Firm's current business mix and financial targets by setting the net revenue as the greater of the net revenue in the trailing four quarters and the current year budget. A bottom-up approach is used for the Firm and the division level operational risk calculation, as the figure for each division is the sum of those for all businesses within the division (adding further conservatism). The table below contains estimates of the Risk Equity figures for operational risk

2.3 Comparison of BIA and Risk Equity Capital Calculations

A comparison of the the current capital requirement under the BIA, both for the Firm as a whole and the UK-regulated entity, based on positive annual gross income[2] from financial years 2005 to 2007 inclusive, is given below.

$mn →	Basic Indicator Approach	Risk Equity		Hybrid VaR[2]	Comments
		FY 2007	FY 2008[3]		
Lehman Brothers Holdings Inc	2,574[1]	4,328	3,514	1,500 – 2,000	Ultimate US-incorporated holding company
Lehman Brothers Holdings Scottish LP[4]	590[5]	***Will have to be a "dirty" calculation, as not currently explicitly calculated***	***Will have to be a "dirty" calculation, as not currently explicitly calculated***	***Will have to be a "dirty" calculation, as not currently explicitly calculated***	UK-regulated entity

Notes

1. *Derived from 10-K filings for 2005 to 2007 inclusive*
2. *The Hybrid VaR figure is very preliminary at this stage and is being refined as the model is being developed (see section 2.4)*
3. *As at end-May 2008*
4. *The most significant revenue-generating entities within the UK-regulated group are LB International (Europe) and Lehman Brothers Europe Ltd*
5. *Based on estimates of figures for 2005 to 2007 inclusive*

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[2] Within the Firm, this is defined as the sum of (i) net interest income and (ii) operating income – see section 2.1.1 above

It can be seen that the capital that the Firm currently holds under it's Risk Equity model for the UK-regulated entity exceeds that required under the Basic Indicator Approach by a margin of ?%

2.4 Future Developments – Advanced Measurement Approach

2.4.1 Background

The Firm is developing a modelling approach to the assessment of the appropriate capital requirement to reflect most accurately its operational risk profile. This will be undertaken in two stages:

(i) the calculation of a "Hybrid VaR" figure utilized a loss distribution approach and combining

- the observed loss history;
- the current business environment that the Firm finds itself operating in;
- assessments undertaken by experienced business managers of potential losses in the future; and
- losses seen in peer organisations and/or those with similar business lines.

(ii) an assessment of how adequately stage (i) captures both existing risks and future ones that the Firm might be exposed to, and the identification through the ICAAP of any capital requirement in addition to that generated by (i) above.

The combination of these elements enables a holistic picture of the operational risk profile of the Firm to be obtained and the economic capital to be estimated. A Loss Distribution Approach (LDA) has been identified as being the most appropriate method of incorporating the observed loss history. This approach, with a VaR-type model underpinning the assessment of internal capital requirements, has been adopted given the nature, scale and complexity of our business, and is being further refined.

The outcome of these two stages is the derivation of an "economic capital" figure (EC) that the Firm believes is an accurate reflection of its current operational risk profile and additionally reflects any material risks that might arise from the external environment in which it operates. The figure for EC may then be compared to the current regulatory capital requirements, which on a Firm-wide basis comprises the CSE requirement for operational risk, and the adequacy of the EC assessed relative to that benchmark.

There will also be the necessity for additional capital to be held for other reasons, e.g. the purposes of achieving a desired cost of funding, the maintenance of a given credit rating, but these more subjective aspects are not considered here. It should be noted, however, that this "buffer" is unlikely to be assigned to any particular risk type, but will be available to address all losses arising in a period of stress, regardless of the nature of the manifested risk.

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3. Stress and Scenario Testing

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3. Stress and Scenario Testing

3.1 Background

A number of more qualitative exercises have been undertaken across the Firm to assess both the ability to carry on "business as usual" and/or the quantitative impact on the operations of the Firm. The ICAAP assessment undertaken by the Operational Risk Management and Analytics will leverage the existing and future studies, given that the expertise to assess best the relevant local operational risks will generally reside outside the department and these informed and detailed analyses already exist. Additionally, the department may commission, participate in or undertake new studies as existing operational risks become more material or significant additional ones are identified, whether as one-off studies (with associated remedial actions) and/or periodic events.

The Firm applies stress-testing based on various scenarios arising from the manifestation of operational risk. In relation to stress-testing for this risk type, the Firm believes that this is less amenable to being treated by the flexing of a distinct number of risk factors (e.g. interest rates) than is the case for market or credit risk. As such, it is necessary and more appropriate to consider significant trigger events and utilise business expertise to assess the impact of those events, rather than adopt a solely quantitative approach. The development of these tests is ongoing, and Operational Risk Management and Analytics leverage various studies to assess the likely impact on the Firm.

The Firm recognises that whilst economic capital is one method of dealing with sudden adverse events a number of mitigants exist, e.g. insurance, existing revenue streams, and others are currently in development. The appropriateness of any mechanism to mitigate the impact of an operational risk event will depend on the nature, scale and scope of any such event.

From the perspective of operational risk, the Firm has initially identified two scenarios that would likely have a significant impact on its ability to continue in a "business as usual" mode.

The impacts of avian flu and a terrorist attack along the lines of 9/11 would be external events over which the Firm would be able to exercise no control, so our understanding of the potential effects of these scenarios needs to be well-researched. The Firm considers these to be credible stress tests, both having been performed in recent times, and the scenarios are capable of significantly impacting on the ability of the Firm to function normally, albeit that they are both associated with a low probability of occurrence.

Consideration has also been given to the possibility of a trading team being lost in its entirety to another firm, but it is believed that this is most appropriately attributed to business risk and, therefore, outside the remit of this work. (Additionally, given the current focus of the most significant entities in the UK-regulated group, specifically LBIE, on liquid markets and relatively straightforward derivatives, the consequent reduction in revenues is believed to be manageable.)

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3.2 Avian Flu

2.4.2 Impact

The avian flu scenario test was performed for the Lehman Group in April 2006; results were derived for each geographic region of Lehman's business. In order to estimate the impact that would have been applicable to the UK-regulated group the most conservative view, based on the headcount in the UK group vis-à-vis the European region, has been taken and expressed in the tables below. The exercise has been updated to reflect both 2007 Actuals and revised business levels, and high-level assumptions are that:

- activity levels are reduced across the majority of European businesses (FID, Equities) to 20% of non-pandemic levels;
- personnel expenses related to (i) salaries and (ii) payroll tax, pensions, etc remain in full, but those related to bonuses are reduced to zero; and
- non-personnel expenses are reduced to 80% of non-pandemic levels, assuming that the Firm has to maintain a presence in businesses and areas even where there is no current business.

(Further detail on assumptions employed, parameters used etc can be found in Appendix A.)

FY 2008 - based on H1 2008 (30 May 2008)		TOTAL ($mn)			
		NON-PANDEMIC		PANDEMIC	
Legal Entity	**IMPACT**	Revenues	Expenses	Revenues	Expenses
LEHMAN BROTHERS LIMITED	**159**	(50)	(1,013)	(0)	(904)
LEHMAN BROTHERS EUROPE LTD	**(241)**	462	(656)	79	(513)
LB LUXEMBOURG INVESTMENTS SARL	**(1)**	1	(0)	(0)	(0)
FURNO & DEL CASTANO CAP PART L	**(2)**	10	(4)	8	(4)
LBAM (EUROPE) LTD	**6**	29	(46)	23	(35)
LBAM (Europe) LTD Amsterdam	**0**	0	(1)		(1)
LB ASSET MANAGEMENT FRANCE	**3**	5	(11)	5	(9)
LB INTERNATIONAL (EUROPE)	**(1,813)**	2,519	(891)	508	(694)
LBIE - Frankfurt Branch	**(30)**	44	(26)	8	(21)
LBIE Amsterdam Branch	**(15)**	17	(15)	2	(15)
LBIE Madrid Branch	**(8)**	10	(19)	2	(18)
LBIE-PARIS BRANCH	**(18)**	40	(37)	18	(33)
LBIE Seoul Branch	**(210)**	239	(24)	22	(18)
LBIE Dubai Branch	**(16)**	16	(6)	4	(10)
LBIE Qatar Branch	**0**	1	(1)	1	(1)
LB Int'l Europe (Zurich Branch)	**(34)**	33	(29)	(0)	(30)
LBIE (Milan Branch)	**(27)**	54	(86)	18	(76)
OTHERS	**231**	(191)		40	
TOTALS	**(2,016)**	3,239	(2,866)	739	(2,382)
NET	**(2,016)**	**373**		**(1,643)**	

Notes

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1. *The impact compares the net position in moving from the Non-Pandemic environment to one where*
2. *Half-year figures have been double to reflect full FY2008 – to be re-visited*

2.4.3 Mitigation

In order to mitigate the impact of an outbreak of avian flu or other pandemic, the Firm also has a Pandemic Working group with sub-groups in this region and representatives drawn from Human Capital, Facilities, Business Continuity Management Health and Safety and Security. The regional response is part of an overall global strategy led by New York and Chaired by the global heads of Business Continuity Management. There are several lines of work focussing on identifying leading indicators of a pandemic, potential pharmaceutical developments, communications strategy, regional advice from the authorities (e.g. the NHS and FSA), procurement and storage of appropriate supplies (anti bacterial soap, masks etc), and increasing resilience, i.e. the number of nominated deputies for key players as a direct result of pandemic exercises and modelling.

This is an extremely severe scenario test, with a very significant impact on the capital of the Firm. However, the substantially reduced amount of business that is assumed to remain would give rise to a much reduced capital requirement; we estimate that, in practice, our surplus of available capital over our regulatory capital requirements would increase.

3.3 Terrorist Attack

3.3.1 Impact

The Firm experienced the 9/11 terrorist attack in New York and has learnt significant lessons from that episode. The impact of that event to the Firm has been calculated as being $719mn, the principal components comprising fixed asset write-offs, losses from leases and ongoing compensation to employees unable to work: offsetting this was some $700mn of insurance leaving a relatively small net loss of £19mn, although this did not include loss of revenues due to subsequent business interruption.

In practice, such an attack may well be followed by a business downturn or recession. This scenario test has not been extended to encompass such consequential effects, as their nature would in all probability be no different from the business downturn and recession scenario that is considered under the avian flu scenario. (For an analysis of the capital impact of a possible consequential recession, see the section “Business and Capital Planning” in the main ICAAP document.)

The methodology for assessing the impact of a terrorist attack on the London headquarters of the UK-regulated group (at 25 Bank Street) requires the following assumptions, some of them conservative in nature.

- All staff in the UK-regulated group are based in the London
    - This will increase the impact, given that the loss figure seen for 9/11 is pro-rated using headcount. A proportion of staff are located away from the main London office, but this assumption reflects the fact that most of the business-critical operations take place within that building
- No insurance is in place to offset any potential loss

- In practice, relevant insurance policies do exist and, although the Firm is confident that their terms are appropriate for an event of this sort, this conservatism reflects the potential for settlement delays/shortfalls arising from disputes over terms and conditions

	Headcount	Impact ($mn)
New York[1]	10,586	719
London	4,515	307

Notes

1. *Includes both New York and Jersey City offices*

3.3.2 Mitigation

The figure above is also conservative as, since the stress test was performed, the Firm has put in place significant insurance coverage for an event of that type. Additionally, the Firm does not own the building at 25 Bank Street so the impact would constitute primarily a loss of fixtures and fittings.

In conclusion, the write-off of fixed assets, in the form of fixtures and fittings, would not be material in the context of the surplus of available capital over regulatory capital requirements for the Lehman Brothers UK-consolidated group.

3.4 Marginal Contribution Analysis

The Firm is also considering the impact of significant, one-off events, e.g. a loss arising from a lawsuit, a settlement of a legal or regulatory case, a rogue trader scenario. It is planned that a marginal analysis of adding such an event to the data used in the Hybrid VaR calculation will be undertaken and the stability of the VaR calculation observed.

Based on the sensitivity analysis that is undertaken in GLORIA, i.e. change in VaR figure when distinct events added

3.5 Risk Control Self-Assessment

Our current RCSA exercise is heavily quantitatively-based: this may not meet the requirements of the regulators or the rating agencies. We need to decide whether we keep to the current format, or adopt a two-pronged approach, i.e. the existing quantitative exercise complemented by a more qualitative, free-form solicitation of business managers' concern. Following that we may need to reflect on how these have been developed and why, the inputs provided by respondents and how these are used

(i) **quantitatively** in the Pillar 1 capital calculation, and

(ii) **qualitatively** in investigating common areas of concern, poor or inadequate controls etc.

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4. Stress and Scenario Testing

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4. Assessment and Conclusion

The Firm currently has a well-tested and robust methodology in place for assessing it's internal capital requirements, namely the Risk Equity model, and comparison between this and the capital requirement under the BIA shows that the former is very conservative relative to the external, regulatory requirement (i.e. $?mn versus $?mn respectively). Additionally, the impact of either an event of avian flu or a terrorist attack would not . Under these circumstances, the Firm believes that the capital held it currently holds is adequate to counter the threats posed by either of these risk events.

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5. Appendices

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5. APPENDIX A: Avian Flu

The exercise undertaken by Finance in 2006 considered the effect on the Firm as a whole and below is an extract (in italics) from the exercise plan.

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The exercise sought to estimate the financial impact to Lehman Brothers from a severe global outbreak of avian flu. The impact of a pandemic of this type utilized external expert opinion on the scale and scope of such an outbreak, and the Firm focussed on the most severe case that might be expected (in excess of 140mn deaths globally, with 75mn anticipated in Asia). The most significant aspects affecting the financial market environment that fed into the modelling exercise were:

- *large scale collapse of Asia, global trade flows and supply chains cut;*
- *flight to quality, extremely limited corporate origination and advisory activity;*
- *global economy reduced by $4.4 trillion, or 12.5%; global Stock indices down 30%; High Grade spreads +20%; and*
- *shutdown of financial markets for short period (i.e. a few weeks), followed by limited trading on electronic exchanges and OTC (10-30% of existing volumes).*

The assumptions underlying this scenario test were very severe; amounting to a reduction in overall business levels to a small fraction of those currently pertaining. For example, revenue from clients was assumed to fall to 20% of its baseline level, banking revenues to fall to 10% of their normal level and a number of businesses would have seen no activity at all (e.g. real estate). Overall, and to give an indication of the magnitude of the modelled effect with the figures updated to reflect 2006 actual revenues, the revenues in the European region were assumed to suffer a fall from $4,006mn to $604mn. Net income estimates reflect the assumption that lost revenues would be partially offset by a consequential reduction in compensation payments and other expenses.

Revenue streams were stressed severely across all business lines and regions, with the Asian region suffering the greatest diminution in business activities, and the Americas the least. In addition, there are the risk effects due to adverse market risk and counterparty credit risk effects. (Further detail can be found in …)

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In order to update the exercise to consider only UK-regulated entities and the current financial year, the following assumptions and parameters were used.

Assumptions

<u>Overarching</u>
Exercise is undertaken for **UK-regulated entity**. Comprises significant entities underneath Lehman Brothers Holdings Scottish LP

- LBIE and branches
- Lehman Brothers Ltd

- Lehman Brothers Europe Ltd
- LBAM (Europe) Ltd (including Amsterdam branch)
- LBAM France SAS
- Furno & Del Castaňo Capital Partners LLP
- LB Luxembourg Investements Sarl

Methodology

- **Actuals Data** - is used where available
- **Headcount** – have identified number of full-time employees within UK-regulated group, based on legal entities above, and associate dthem with apporpiatre busness lines
- **Revenues** – possible to flex these to indicate differing remaining activity levels: original exercise did this on a regional basis
- **Personnel Expenses** - following outbreak of pandemic these are reduced to level of annual basic salary alone, i.e. contractual requirement with no bonus component, but including pension payments, tax etc
- **Non-Personnel Expenses** – figures taken pre-recoveries (conservative), and assumed to be fixed during course of year
- **Mumbai operations** - currently excluded for headcount purposes – assumed to be pure support function and no revenue/expense splits available
- **Calculation**
    - headcount is associated with location/legal entity/buinsess (at BPM0 or BPM1 level?) combination
    - revenue and expenses are identified at legal entity/divisional/BPM0/BPM1 level and allocated out to locations on headcount basis
    - the estimated reduced activity levels following an outbreak of aviuan flu are used to reduce the reveneues, the personnel expenses sare reduced to salary only (eliminating bonus payments), and the non-personnel expenses are kept static
- **Update** - on semi-annual basis; use YTD figures and project for remainder of year based on run rates

2006 – Assumptions

- **Revenue** data available at region level; allocated out in Europe based on headcount of UK-regulated entities
    - Investigating availability of revenue figures from Essbase on legal entity/BPM basis. (To be taken up with David Hawes [Finance, London], although both Dennis Ciocon and Yusuf Yasin [members of ORM] have some access to Essbase.)
- **Personnel and non-personnel expenses** obtained from Essbase on legal entity/BPM basis
    - Have utilised figures for Global BPM for personnel expenses prior to pandemic - there is significant variance between Europe BPM and Global BPM in Bonus line. Main reason is that Bonus is accrued at a legal entity level and booked to Non Core P&Ls which roll up to BPM America – assumed here that it is necessary to attribute bonus to UK-regulated legal entities

2007 – Assumptions

- **Capstone and ELQ** removed from the UK-regulated group

- All headcount assumed to be in Europe – currently 5,003, of which 97 in Asia (in LBIE Seoul branch) and 5 in Americas
- Revenues can be split out across legal entities by division, but not possible to do with expenses, both personnel and non-personnel

Potential Refinements

- Better align revenue streams and differentiate impact across location according to local preparedness, available health facilities etc
- Refine allocation methodology to consider only "producers" within each region
  - Treatment of Mumbai operations to be determined – support function only?
- Determine headcount based on both legal entity and physical location (i.e. distinguish between LBIE employees based in London and those based in continental Europe and elsewhere)

Activity Parameters

Division	Region	REVENUE - Remaining Activity	Comments re FY2006 Exercise
FIXED INCOME	Europe	20%	Assumed to fall under Client Revenue
	Americas	25%	
	Asia	10%	
EQUITIES	Europe	20%	Assumed to fall under Client Revenue
	Americas	25%	
	Asia	10%	
TOTAL PRIME SERVICES	Europe	20%	Assumed to fall under Client Revenue
	Americas	25%	
	Asia	10%	
INVESTMENT BANKING DIVISION	Europe	10%	Banking Revenue
	Americas	15%	
	Asia	0%	
INVESTMENT MANAGEMENT	Europe	80%	Asset Management
	Americas	90%	
	Asia	70%	
PRINCIPAL INVESTING	Europe	0%	
	Americas	0%	
	Asia	0%	
MORT CAP DIV	Europe	0%	MCD
	Americas	0%	
	Asia	0%	
NON-CORE	Europe	0%	
	Americas	0%	
	Asia	0%	
CORPORATE	Europe	0%	
	Americas	0%	
	Asia	0%	

EXPENSES – Remaining Proportion	
Personnel - Salary, Compensation and Benefits	100%
Personnel - Bonus	100%
Non-Personnel	100%

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GLOSSARY

AMA	Advanced Measurement Approach
BIA	Basic Indicator Approach
CSE	Consolidated Supervised Entity
LDA	Loss Distribution Approach
ORA	Operational Risk Analytics
ORM	Operational Risk Management

Annex R: Revision History

Version	Author	Date	Amendment(s)	Sign-Off By
1.0				

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