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MANAGING CONCENTRATION RISK - A REVIEW OF INDUSTRY PRACTICE

A survey of leading financial institutions
(August 2006)

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EXECUTIVE SUMMARY

The following summary attempts to capture the main themes to come out of the industry responses to the CEBS' questionnaire on Large Exposures.

It is clear from the industry's responses that how firms manage concentration risk at a group level bears little or no relation to existing large exposures regulatory regimes across jurisdictions. In many cases it was said that the current regime restricts large low risk transactions which can lead to a firm having to redirect resources and distort business practice. Nowhere was this more prevalent than in the area of intra-group exposures, which were largely excluded from the industry's own assessment of concentration risk and not considered worthy of the regulatory restrictions placed on them. This report therefore attempts to highlight important differences between how firms look at intra-group exposures as opposed to "third party" counterparty exposures in assessing credit and concentration risks, and explain the main reasons for the distinction. Details and examples are included in Chapter two, entitled "Who is the counterparty?"

The questionnaire seemed to be founded on the premise that single-name concentration risk is somehow separate from credit risk. In fact it is an integral and indivisible part of any credit risk management framework. While we understand the desire to only solicit information from the industry on concentration risk, the implication of many of the questions was that a certain activity would be exclusively undertaken for the specific purpose of managing concentration risk (exposure measurement, "look through", stress testing etc). In truth, industry responses showed that the measuring and managing of concentration risk and the recognition and realisation of the benefits of diversification form an integral part and prime objective of a much broader credit risk management framework. Single-name concentration risk is not a separate risk category and management of single-name concentration risk cannot be separated from credit risk management. Therefore many of the answers given to questions such as how counterparties are identified, the measurement of exposures, how firms assess the exposures and risks in structured transactions and the extent and nature of firms' stress testing activities do not only refer to the management of large exposures and other concentrations, but to the firms' overall approach to diversification and the managing of credit risk. This is reflected throughout the report in each of the chapters.

There is much diversity in industry practice with regards to managing concentration risks. If you consider that most of the responses that this report is based on came from large internationally active financial institutions, then it is safe to assume that much more diversity exists in practice in a financial industry covering all shapes and sizes of credit institution. In particular we would expect a lot of smaller less sophisticated organisations to take as their starting point for managing large exposures the existing regulatory regime, complete with regulatory definitions and regulatory limits. Among the larger firms this diversity is evident through the many different approaches described in the report, often reflecting firm specific organisational structures and business models. The nature of the concentration risk itself varies from one response to another, with emphasis changing from, say, the liquidity and day-to-day management of a trading book portfolio to the volume and credit spread of exposures in a large retail book. A key area of divergent industry practice is in the range of different benchmarks firms use against which they monitor concentration risk, including the overall credit exposure, total assets, risk appetite, and a range of capital measures (such as internal, economic and regulatory capital). These included comparing large exposures to the overall credit exposure, to total assets, against

risk appetite, and versus a range of capital measures (such as internal, economic and regulatory capital). There was no clear pattern that emerged as to which type of organisation adopted which definition, but without a clear message on a consistent measure of concentration risk it is difficult to envisage a single regulatory measure that would be appropriate for everyone.

When firms talk about concentration risk responses indicate they are primarily talking about the measuring and managing of single name concentration risk. As such the “tools” employed specifically designed to address such risks feature heavily in the firms’ responses. The single most important tool used by the industry in this respect is “Limit setting”. Other important tools used and outlined in this report will often have broader objectives and be designed to capture a wider range of risks, such as stress testing and Credit Risk Mitigation (CRM). On the whole the responses show that firms adopt a more sophisticated risk sensitive approach to limit setting than that embodied in the existing regulatory framework, and this can often lead to two sets of limits being maintained. For obvious reasons this was not considered a desirable outcome for this current review, and the contents of Chapter four expand on this theme.

A clear message from this report that may not feature predominantly in the CEBS report is the importance of risk avoidance alongside risk management. Firms rely significantly on upfront deal evaluation, particularly for structured transactions. For example, many customers will not receive credit without collateral; many transactions will not be entered into unless certain exit clauses are present. The report also covers the range of CRM techniques that the industry uses to manage and mitigate risks. Many of these (collateral, derivatives, etc) will depend on the growing importance of netting in measuring exposures across both the trading and banking books. Firms perceive that regulatory recognition of the mitigation of risk resulting from netting is unduly cautious, and so separate exposure measures are often required.

For many of the more complex transactions, variety will often prevent firms from developing and documenting standardised policies. This means that for some transactions certain questions, such as who is the counterparty, can only be assessed and answered on a case by case basis. It is therefore very difficult to discern any commonality of approach across firms. The report also covers the role of economic capital models in managing credit risk and how they can be used to manage concentration risk. However, it is clear that the need for credit risk management arises prior to, and independently of, any economic or regulatory capital models. The survey appeared to be founded on the premise that concentration risk limits are needed because of inadequacies in regulatory or economic capital models. This is false.

Finally, we cover the common concerns expressed about the current regulatory regime and the differences in the way that regulators have implemented the regime across the EU. The lack of a global approach to concentration risk, which also has an impact, as the majority of the firms operate in many more jurisdictions than those applying the CRD, was also raised by a number of firms. Such differences add to the cost of doing business as this requires management information to be adjusted to fit the needs of each regulator, thereby requiring separate processes to be set up, resulting in the inefficient use of scarce resource (including management time) and duplication of effort. Any regulatory regime needs clear objectives, and many firms believe that the objectives of the current regimes were unclear.

BACKGROUND

ISDA LIBA and BBA members have been monitoring and discussing the recent debate in Europe on the Large Exposures (LE) regulatory framework since consultation with the industry formally began towards the end of last year.

The EU Commission acknowledge that the present rules, dating back to the early 1990s, do not sit comfortably alongside the new Basel 2 framework “and no longer appear pertinent”. Informal consultation with the industry by the Commission revealed that, for larger banks at least, the reporting requirements were burdensome and a poor fit with industry best practice. Article 119 of the recast Capital Requirements Directive (CRD) requires the European Commission to produce a report on the LE framework together with appropriate proposals by 31st December 2007. The European Commission proposed to cover three key areas: increasing prudential soundness in light of new techniques in supervision and regulation, greater harmonisation across the member states and, reducing, where possible, regulatory burden.

At a meeting of the European Banking Committee (EBC, successor to the Banking Advisory Committee, composed of high level representatives from the Member States and chaired by a representative of the Commission) in July 2005, member states were presented with a proposal from the Commission on how to proceed. Several work streams were proposed, including work to be conducted by the Committee of European Banking Supervisors (CEBS, the EBC is formally tasked with monitoring the activities of CEBS in seeking convergence in supervisory practices). CEBS was charged with providing the following specific technical advice on the Large Exposures regime: a stock-take of current supervisory practices; an industry consultation on current practices; and an analysis of credit risk mitigation techniques and products used within the LE framework.

Industry members of ISDA LIBA and the BBA have been meeting to discuss the LE review in a variety of forums, including a UK FSA LE expert group, since October 2005. So far, ISDA LIBA and BBA members have contributed industry thinking on the objectives and principles of an LE framework, factors to be considered in the assessment of a regime, comments on the interaction with concentration risk coverage in Pillar 2 (CEBS Consultation Paper no.11), feedback on the supervisory stock take, comments on a proposed industry questionnaire, and a template and notes to help firms to complete the questionnaire. This report is the latest contribution from the industry group.

Together our combined membership represents a diverse group of internationally active financial institutions incorporated in a number of states both within and outside the EU and operating across the broad spectrum of European and international capital markets. A sub-section of our members, made up of large internationally active financial institutions, provided detailed responses to the CEBS LE questionnaire. We have summarised the answers in this report.

In general, our members found the CEBS questionnaire difficult to complete. This is because many of the questions were ambiguous and seemingly required firms to respond in very broad terms (how are things done?), providing as much detail as possible (individual product basis?). Therefore, with very little time to coordinate answers internally, questionnaire responses tended to include a significant amount of repetition, with answers on the same theme or subject matter being provided in different places. Additionally the questionnaire seems to be founded on the premise that single-name concentration risk is somehow separate from credit risk. In fact it is an integral and indivisible part of any credit risk management framework. Since many of the questions were inconsistent with

the way firms view the risks, they were very difficult to answer in a way that was neither incomplete nor misleading. As a result the answers received were extremely diverse. In many cases, it has not been clear whether the apparent diversity reflects genuine differences, or whether it reflects different attempts to describe roughly the same thing¹. In order to try to distinguish between genuine and artificial diversity, and to produce a coherent report, the associations have found it necessary to split the subject into themes, and to summarise the answers according to that structure, rather than by adhering closely to the structure of the questionnaire.

Therefore, the report is set out in four chapters. The first chapter roughly corresponds to questions 1-2, and gives an overview of industry's approaches to concentration risk and some of the definitions given for types of concentration risks used in practice. This chapter also outlines the similarities and some of the differences between the risks in the trading book and the banking book. Chapter Two, "Who is the counterparty?" corresponds to CEBS' questions 3-4, 11-12, and 14. It summarises industry practice in the area of "connectedness" of counterparties, intragroup exposures, how structured products are viewed and counterparties identified, and practice in the area of "indirect" exposures. Chapter Three, entitled "Tools to manage concentration risk", reports on the key functions firms perform which can help to both limit and manage concentration risk. It covers limit setting, governance and authority, monitoring and reporting, the measurement of the amount at risk, credit risk mitigation, use of internal credit models, and stress testing. The chapter corresponds loosely to answers given to questions 5-6, 10, 13, and 15, and features a section on Economic Capital models. The final chapter looks at the current regulatory environment, and contains a few pointers to how this could be improved for the industry in the future. A paper on the objectives and principles of large exposures regulation is attached as an appendix.

¹ For example, many felt that question 2 ("the nature of concentration risk") was left deliberately very open-ended by the regulators. The majority of firms read this question to mean what definitions of concentration risks do you use (what is your definition of single name/concentration risk or what analogous concepts you use?), although some respondents chose to provide regulatory definitions instead. Also, firms agreed that the last 2 categories in question 5 (settlement and intraday exposures) were confusing as they do not relate to types of transactions (loans, guarantees, derivatives etc). "Settlement exposures" could be referring to, for example, large foreign exchange trades that do not settle "delivery versus payment" or it could refer to trades that have failed to settle. Additionally it was unclear what the regulators were seeking in respect of intra-day exposures.

CHAPTER ONE

General approach to concentration risk

Concentration risk measurement and management is considered an integral part of a firms' overall approach to credit risk management, and a prime objective of the credit risk function. Managing credit risk at large financial institutions is a complex process consisting of many different activities, spanning many divisions, consuming extensive human and IT resources at all levels of the firm.

While there is considerable focus on capital in the debate on the treatment of large exposures, the financial institutions are most interested in measuring and managing the risks involved, and this can include risk avoidance. Once risks have been acquired and identified, firms can choose to mitigate them by eliminating them (hedging), transferring them (by credit protection or insurance), or to retain them (effectively self-insuring, with capital).

At the more sophisticated firms credit risk models and economic capital allocations are embedded throughout risk management and incentive systems. The primary objectives in developing economic capital models are to provide a consistent and comprehensive risk management tool to measure, control, and mitigate risks. These models are mainly used to assess the total economic capital allocated across the firm with a view to determining the overall capital needs of the institution. However, they can also be used to analyse return on capital, provide risk-adjusted measures of performance, and optimize investment of capital across competing business opportunities.

Although the models are usually applied at a portfolio level, they can also be applied to individual exposures as they allow you to assess the risk-return characteristics of each exposure, and the exposures' risk contribution to the portfolio. This is likely to incorporate correlations with other existing transactions and account for aggregates of relatively homogenous assets such as credit card lines and mortgage portfolios. The objective of using models for this kind of transaction or sub-portfolio analysis can be described as quantifying the diversification benefit of additional exposures (new business or trading opportunities). Diversification can therefore be a key benefit to using an economic capital model, where credit concentrations can be managed so as to reduce the risk of an institution's exposure to the unexpected failure of a single borrower, or a significant downturn in a particular industry or geographical area. By spreading the firm's risk over many borrowers, industries, or regions instead of a few, it is possible to minimize the collective impact of economic events or trends on both earnings and capital.

However it is important to emphasise that the aim of economic capital is not to capture concentration per se, but to measure risk. Economic capital provides a common language and metric for assessing and managing the risks associated with portfolio management, performance measurement, profitability versus capital, and other strategic business decisions. In a few cases though they are used to help in other areas, including the measurement and management of concentration risks (see section on tools).

What is concentration risk?

Broadly speaking concentration risk arises when a firm has a credit exposure to a counterparty or related group of counterparties, or to a product, industry or country which is large in relation to the firm. The revised Basel framework defines a risk concentration as any single exposure or group of exposures with the potential to produce losses large enough (relative to a bank's capital, total assets, or overall risk level) to threaten a bank's health or ability to maintain its core operations. We believe that these two definitions are consistent.

The risks are identified in most firms along similar lines: exposures to single customer groups and groups of related customers; distinct industry or sector groups; and geographic sets, often defined along country borders. Risks can build up through direct exposure, or indirectly through, for example, unfunded credit protection, or correlation. It is possible therefore to decompose concentration risk into two categories: single-name concentration risk, which can arise directly or indirectly (for example, by way of purchased protection); and portfolio concentration risk, which is a collective property, and which arises as a result of correlation.

A typical response:

Credit Risk is managed primarily on a single-name (Risk Party) and consolidated entity (Ultimate Parent) basis. Credit worthiness is assessed and credit limits assigned at these levels.

In addition, we have tools and procedures in place which allow us to identify aggregate exposures using a number of criteria including:

- Obligor grade*
- Product or product group*
- Obligor Industry*
- Region*
- Country*

Measurement of exposures across these criteria is done on a routine basis and reported weekly, monthly or quarterly to senior management. We also have the ability to stress test exposures to individual Risk Parties or groups of Risk Parties.

The risk of loss resulting from concentration risk

Not all respondents chose to offer a definition for the risk of loss resulting from concentration risk. More than one firm stated that they did not define loss in these terms. One firm stated that this was not defined in its own right but was included as a driver within the credit VaR score and therefore within the economic equity calculation. Here are some of the other ways firms looked at loss from concentration risk:

- One firm defined risk as the volatility of P&L and the risk of loss resulting from concentration not consistent with our stated risk appetite.
- Another defined it as the potential for loss based on a "credit VaR" approach derived from the credit portfolio model. Using this method, due to the used simulation approach, concentrations in single name exposures are explicitly reflected. Sectoral and geographical attributes are considered in the embedded correlation model.
- A third firm defined the loss as the risk of an unexpected accumulation of credit related losses within a given time horizon. The origin of the accumulation (single name vs. aggregates by selected attributes) is a priori not considered relevant to the definition.
- A further definition offered was the risk that the proportion and correlation of assets in a particular industry, sector, product, or region leads to impairment in a given period that is out of line with external expectations

causing a disproportionate reduction in market capitalisation or, in extreme cases, that is large enough to threaten the Bank's health or ability to maintain its core operations.

We believe that this diversity of responses reflects the ambiguity of the question and the fact that firms do not generally regard concentration risk as a separate category of risk.

Managing significant single name exposures and concentrations

Credit risk management begins with an exposure measure and a limit. Firms set limits on exposures to single counterparties (or groups). This approach logically results in the management of single-name concentration risk. In the responses to the questionnaire firms found it difficult to disentangle single-name concentration risk from credit risk. It proved to be difficult to answer questions founded on the premise that the two were different.

Firms may set limits in absolute terms, or relative to some other number, the most common of which is some form of internal or external capital number. Therefore the most common answer to the question of what is being managed was the exposure limits themselves, and in particular the limit usage and risk capital consumption for each borrower. Other internal "benchmarks" include risk appetite, in terms of risk return requirements, under a given set of circumstances (scenario analysis, such as a single name default or an economic downturn), in absolute terms (given perceived credit quality of customer), versus external expectations for the amount of provisions or impairment charges in a given period, and the risk of a reduction in earnings and/or value through financial or reputational loss. For example: *"We are managing to ensure that the Group's (or an individual member within our Group) exposure to a single name does not become excessive either as a percentage of the capital base of the respective lending bank, or as an absolute amount given the perceived credit quality of the customer"*.

The same firm defines the risk measures as an aggregation of the limits approved for each customer group. These limits are classified into three categories: category A covering all on balance sheet lending and trade related facilities such as guarantees and letters of credit; category B including all off-balance sheet treasury risk such as foreign exchange and interest rate swaps; and finally a settlement category covering intra-day risks primarily associated with undertaking payments and foreign exchange business with and on behalf of customers. The aggregate of the limits available to the customer group constitute the single name exposure. Furthermore, each customer group is identified as operating in a specific industry or industries and the aggregate of approved limits for each specific industry constitutes the concentration risk to that industry. The firm may consider establishing caps to control the level of risk they are prepared to take in that industry.

What are the risks?

One firm gave two answers to this question: firstly "event risk", such as defaults of large counterparties causing large losses; and secondly, correlation between borrowers. Another firm explained that it looked at concentration risks in terms of Loss Given Default (LGD) expressed in monetary terms for each counterparty. This firm set limits based on the magnitude of loss that they believe would need to be disclosed to the market. The LGD is the amount that they would expect to lose in the event of default by the customer, and hence the amount that would be disclosed.

It has been suggested by regulators that such risks are managed to ensure that model outputs are not undermined by incorrect correlation or diversification

assumptions. Most firms disagree. Incorrect correlation and/or diversification assumptions are a model risk. This risk clearly exists, but it is not a reason to manage concentration risk. Concentration risk arises as a result of the business of banks and investment firms, regardless of whether it is modelled.

A few firms linked concentration risk to “tail event” losses, and stated that single-name concentration risk is managed to protect against losses in the distribution beyond a chosen confidence interval. Others also said that the risk is conceptually related to tail events, as only large portfolio losses contribute to the tail of a portfolio loss distribution, that is to say, unexpected credit losses from extreme events and single name, sectoral, and geographic concentrations are key drivers of the distribution in general and the tail in particular.

Reference was also made to the possibility for losses from concentrations occurring over a shorter timescale than over the normal regulatory horizon of one year. However firms dismissed the notion that concentration risks were sensitive to different time horizons, explaining that credit risk is generally monitored over the lifetime of an exposure rather than over an arbitrary time horizon. One firm was keen to point out that measuring risk was not always about capital allocation and a one year time horizon.

Concentration risks in the trading book

On the whole the industry makes no distinction between trading book and non-trading book items in its approach to concentration risk. Concentration risk in the trading book was described by one firm as the potential loss arising from positions held for trading in securities and other obligations in tradable form. It refers to the potential loss from large price movements due to credit related events and, ultimately, default and insolvency of an issuer or obligor. The tools used by firms to manage the risk in the trading book are broadly similar to those used in the banking book, and are outlined in more detail elsewhere in this report. Differences relate to the calculation of exposure measures (see also section on exposure measurement), where internal measures are different from both the banking book and regulatory exposure measures. One of the key differences between internal measures and regulatory measures in the trading book is in the treatment of netting. As one firm described, “*this dual approach recognises the value of the regulatory measure while allowing for the fact that we believe certain trading related issues and views are not sufficiently addressed (netting, option delta weighting, and treatment of credit derivatives).*”

In the trading book, firms use models to estimate credit exposure. Credit exposure is uncertain, because the value of trading book transactions such as derivatives and repos depends on market prices. Exposure models use estimates of distributions of market price changes to generate distributions of exposures to a given counterparty over some horizon in the future. Correlations are incorporated (note that these are market price correlations, not default correlations; indeed these models have more in common with value at risk than with portfolio credit models). These exposure distributions are typically mapped to a single exposure measure, such as “peak exposure” or “expected exposure”, that summarises the distribution of potential future exposures.

The set of transactions included in each exposure calculation is usually the set of trades with the counterparty that are subject to a netting agreement (‘netting set’). These exposures are aggregated with other exposures to a counterparty in order to calculate the firm’s total exposure. This is the most important number. There are differences between the assumptions used to calculate exposure, but if a counterparty defaults, it does not particularly matter whether an exposure is

held in the lender's banking book or trading book. Splitting portfolios into two sub-portfolios can introduce distinctions that are, for large exposures purposes, rather arbitrary. Correlation and diversification assumptions are also considered as part of firms' internal economic capital models (see separate section on exposure measurement).

For portfolios of derivatives exposure measures are typically derived using monte carlo simulations. Where it is not currently being used, firms reported their intention to move to monte carlo based models in the near future. Margining does not have to be incorporated directly into the monte carlo engine, but it can be. The effect of frequent re-margining is to introduce a cap on exposure beyond the assumed re-margining period. Less elaborate modelling is often employed for funding transactions and these include historical simulations, variance-covariance and mark-to-market plus add-ons.

At least one firm said that they did not set limits for trading book exposures, stating that because of the liquidity of the instruments concerned they were able to trade out of the risk with ease. However, this did not mean that there was not an approval process, where approval is based on the potential loss and "riskiness" of the concentration and the relevant approval authority can request an immediate reduction in the concentration at any time. Other tools used for trading book concentrations included stress testing, where firms did not distinguish between the techniques employed for banking book exposures and those used for trading book exposures (see separate section on stress testing). In some cases, however, the time horizon and the frequency of the testing were different, reflecting the liquidity of a portfolio of tradable assets. However, the objective of measuring potential losses from the default of issuers or obligors remained the same.

Concentration risks in the banking book

Whereas the trading book definitions of concentration risk tended to focus on the potential losses for positions held, on the banking book side, with respect to the wholesale credit portfolio, the emphasis was more on calculating both single name, and regional and sectoral concentration risks. One firm defined the risk as a corporate default risk resulting in a loss of a significant amount of capital due to a bankruptcy or failure to pay of a single borrower or borrower group or the loss of a significant portion of capital as a result of sequential bankruptcies or failure to pay of clients in the same industry or geography over a period of time in response to cyclical industry factors, or country risk events.

Sector and Industry concentration risk

This type of concentration risk is defined by one firm as a significant deterioration of market conditions for all clients within one industry sector, caused, for example, by macroeconomic development, law changes or other stress events. The same firm suggested that correlations between borrowers within one market or industry could also increase this risk. Identifying these concentrations is more challenging. Defining the limits of a sector or industry can be difficult because the boundaries may be fuzzy (e.g. does real estate include a warehouse occupied by a manufacturer?).

Such risks are more often than not subjected to a variety of stress tests, looking at potential loss perhaps in relation to an increased provision or impairment charge over a one year time horizon from a series of non-systemic scenarios (i.e. focused on specific industry sectors). On the whole these scenarios will be designed as relatively plausible events, i.e. these are not considered 'tail event'

losses. By using a scenario based approach to stressing industry exposures firms are able to take into account correlations between industry sectors. A trigger limit, based on a percentage of Group profits, can be set on the stressed impact on the provision or impairment charge under each scenario.

In conjunction with the above, detailed reviews of key industry sectors are conducted at a number of firms. These reviews facilitate the selection of the highest quality assets within each sector by setting out lending guidelines which identify sub sectors where different degrees of risk appetite are considered.

Geographic or country specific concentration risk

This is defined and managed by the industry in a number of different ways. In fact it covers two kinds of risk. The first is simply an example of correlation risk, where in this case the correlation arises from common exposure to country-specific macroeconomic factors and events and government policy. The second is a special kind of risk, country transfer risk: an inability to transfer funds from a country as a result of government policy, such as the suspension of payments imposed by the Russian Federation in 1998.

At least one firm defined "country transfer risk" as the risk that a country may be unable or unwilling to honour its cross border foreign currency obligations. It is considered separately as the counterparty may be solvent and able to honour its obligations domestically, but be prevented from remitting hard currency outside of the country in which it operates. Concentrations of exposure to certain countries therefore require separate consideration. As with the other types of concentration risks, these can be managed by using limits. These limits will often be derived from country rating grades, and by assessing the results of stress testing and scenario analysis.

Firms manage the risks in a variety of ways. All appear to try to identify high-risk countries. More than one firm maintains country "status" lists, with particular categories reflecting a high risk (e.g. emerging market countries). (It is important to note that high-risk countries do not include EU member states. Country transfer risk is not a compelling reason to set limit on exposures to other EU countries)

Some firms ensure that exposures to higher-risk countries are subject to an extra degree of scrutiny. Approvals are required for exposures to countries in the high risk category.

Some firms set a "country risk appetite", approved at a senior level, with input from divisional heads and senior business representatives. At least one firm has a "country risk advisory forum" with the power to override the risk appetite and impose a lower appetite, typically for the smaller countries and/or where the forum considers this to be appropriate on risk grounds. Another firm maintained country limits for emerging markets in order to manage geographic concentrations which are monitored on a weekly basis, and subjected to limit constraints. Some firms indicated that they used country LGDs, factored into the limits to entities in those particular countries. Many firms stress tested for country risks, where country specific portfolios were chosen on a risk-based approach (e.g. Turkey, Russia were mentioned, perhaps prompted by current events) and stressed against country-specific parameters, such as foreign exchange spreads, bond prices, and equity indices.

CHAPTER TWO

Who is the counterparty?

A key distinction is made by firms between “third-party” counterparties and “other” counterparties (largely made up of intragroup exposures). The majority of this section deals with the responses given in relation to “third-party” counterparties. A separate section covers the treatment of “other” counterparties.

“Third-party” counterparties

Two third-party counterparties may be sufficiently closely linked with each other that they are best considered a single credit risk (because if one defaults, the other will too). Firms have to decide which types of links are considered strong enough to trigger a decision to treat two counterparties as one. This is the question of “third-party connectedness”. What determines a group varies from firm to firm, but this is often driven by legal requirements imposed by regulators.

Each firm sets down policies on third-party connectedness (typically at a group level). It seems that these policies differ substantially across firms. What seems to be universal, however, is that connectedness policies cannot be followed automatically or rigidly. Neither ownership nor control are ‘either/or’ concepts. Each counterparty will often require a case-by-case evaluation.

In most cases the independence of the group function guarantees a neutrality in the decision making process and ensures a conservative approach to “connectedness”. In one case they identified “an independent data management team” as responsible for managing and documenting linkages between customers forming larger groups.

Examples of connectedness policies include:

- *“A group of related counterparties exists where individual counterparties are connected in such a way that the **financial soundness** of any one of them may affect one or all of the others”*
- *“In line with regulatory requirements connectedness of counterparties is determined by whether they meet either or both of **the control and financial soundness tests**.”*
- *“For internal risk measurement purposes we generally define connectedness of counterparties through **legal ownership** (i.e. parent/subsidiary relationships)”*
- *“**Parents and subsidiaries** are generally considered to be connected in those cases where the parent company consolidates the subsidiaries as a result of having full management control of the subsidiary.”*
- *“We generally follow the structure of the **group hierarchy** as provided by the client, but, if appropriate, may add risk that is economically tied to the same group (e.g. related to guarantees, special purpose companies, leasing, etc.)”*
- *“Connectedness is managed by allocating groups of Risk Parties (RP) within **Family Trees** with an Ultimate Parent (UP). Exposures can be reported on a RP, RP and below or UP and below basis. The UP entity can be a corporate or another type of entity (Sovereign, quasi-Sovereign, Fund, Individual) depending on the type of counterparty family.”*
- *“..comprises one or more entities, which are related through common ownership, control or management (“related entities”), and represent **“Common Risk”**”*

- *“a relevant input for the credit portfolio model is the linkage between counterparts following economic and not legal principals (**economic obligor group concept**)”*
- *“Connectedness is based on majority ownership but also taking into account other factors such as **contingent liability** of one party for the liabilities of another counterparty”.*
- *“Group membership is defined primarily **by ownership**, with an equity share of more than 50% defining a formal group connectedness.”*
- *“Besides direct or indirect holdings of over 50% of the voting rights, the controlling influence and recognizable **mutual interdependencies** are taken into account”.*

An important message to come out of the industry's responses is that firms often apply more or less the regulatory requirement when it comes to grouping legal entities to groups of related counterparties. However, some grey areas were identified, including in the case of financial interdependencies and the question of control (see below), which both require judgement and may be interpreted differently from one firm to the next.

One of the key indicators of “connectedness” is “financial soundness”. This is taken to mean that for a group of related counterparties, individual counterparties are connected in such a way that the financial standing of any one of them may affect one or all of the others. This could also be taken to mean that where the same factors affect the financial soundness of a number of entities they would be considered connected. One firm highlighted however that it was not intended to require aggregation of counterparties who operate in the same business sector, where, for instance, they might all be affected by changes in the same factors e.g. the cost of raw materials. Key determinants of financial soundness according to one firm include ownership, common ownership (where there is not a formal holding company structure), common management or directors, or common funding arrangements, such as cross guarantees (see below for factors to be considered).

Often accompanying the test for “financial soundness” and again driven by the regulations, a few firms described a “control test”, which assesses the degree of control that one counterparty has over another. In situations where there is full or majority ownership or the financials of one counterparty are consolidated with financials of another, e.g. parents and subsidiaries, then control is presumed to exist. However, control was not easy to determine for all arrangements, for example, where one counterparty has minority share ownership but significant influence over strategy or key appointments. In such instances it is a requirement to look beyond legal structures in order to determine whether control exists and where this is the case then counterparties will be aggregated.

The legal ownership approach attempts to reflect the parent subsidiary relationships, where group hierarchies are formed by linking counterparties together. One respondent connected parents and subsidiaries in cases where the parent company consolidated the subsidiaries as a result of having full management control. In general the “legal ownership” approach is flexible enough to allow counterparties to be linked together even where there is no parent-subsubsidiary relationship. The relevant credit officer would make this judgement based on the risks involved in the particular transaction or structure. This approach can often exceed the requirements of the regulations, where additional risk that is economically tied to the same group (e.g. related to guarantees, special purpose companies, leasing, etc.) is added if considered appropriate.

Another firm talked about evaluating ownership, control and management in order to identify “common risk”. Common risk is defined on a case-by-case basis, again using expert judgement, with reference to the factors set out below. Where common ownership is considered, to define a group of connected customers the firms will often consider on top of either direct or indirect holdings, joint ventures and/or partnership arrangements.

Factors to consider

Factors mentioned in the responses were too numerous to list here, but many of the firms considered the same list of criteria for determining a connected counterparty. The criteria were often implicit in the definition of “connectedness”. The extent to which more complex arrangements are considered reflected the nature and complexity of the businesses of the relevant respondents.

Factors included the following:

- i) One or more of the counterparties holds directly or indirectly power or “control” over the other. In one case “control” was said to exist where there was evidence of an equity interest of 50% or more in the counterparty in question or where management of one counterparty controls the management of another, regardless of equity interest;
- ii) Where it is determined that if one counterparty experiences financial problems, the other counterparties are likely to encounter payment difficulties;
- iii) If counterparties are linked by cross guarantees or where a counterparty’s liabilities are guaranteed by the same guarantor;
- iv) Where the expected source of repayment is the same for each entity;
- v) If the counterparties are part of a corporate group and there is material interdependence between them;
- vi) Where one entity is considered vital to the operations of a related entity
- vii) If there is co-mingling of treasury operations and/or shared credit accommodation between the entities;
- viii) Besides direct or indirect holding of over 50% of the voting rights, the controlling influence and recognizable mutual interdependencies are taken into account for aggregating groups of related counterparties;
- ix) When considering associate companies and joint ventures whether there are majority voting rights held or if “de facto” control exists or a reliance on inter company trade exists;
- x) Different clients may also be deemed as connected where the creditworthiness of any one of them depends critically on the other (e.g. credit exposure is secured by shares in a company forming part of a group of connected customers); and
- xi) Where there are common directorships, and circumstances permit influence to be exerted over the financial affairs of the other companies concerned.

Clearly, there is a lot of overlap between these factors, but they all seem to be related to ownership, control and/or financial soundness (joint default).

Aggregation process

The process of aggregation generally follows regulatory requirements whereby the credit exposure related to counterparties has to be aggregated for credit approval, limit setting and relationship management purposes. Concentration limits will therefore apply at both a single name entity level and a group level to the extent that one exists.

This process is often carried out at a group level within the firm. In at least one case this group sat in the part of the firm with the largest exposures, and was responsible for determining the appropriate approval authority (dependent on the

total exposure to all connected counterparties), and submitting the relevant report. However, one firm said that due to the large number of customers that the group has, it was not always practical to aggregate all exposures to connected parties e.g. where small value exposures to different products or brands are managed on different operating platforms. For these types of exposures the firm established a set of “de minimis” limits below which aggregation is not required. Such limits are modest in size and kept under regular review. Another firm gave an example of situations for associate companies and joint ventures with a less than 50% equity interest aggregation did not take place, except where one or more of the following applied: majority voting rights are held; “de facto” control exists; management control is held; effective responsibility is taken for the financial obligations of the associate company or joint venture; and/or a reliance on inter company trade exists.

Intra-group exposures

A different issue arises when the counterparty is not connected to another third-party, but to itself, or its group. Firms regard the risk associated with intra-group exposures to be primarily an operational risk, not a credit risk. As a result, intra-group exposures are often managed by a different function within the group, namely treasury. There were no discernible differences between investment firms and banks on this issue.

There are a number of reasons for the different approach taken to intra-group exposures:

- There is a fundamental difference between connected parties and third parties. A third party's decision to default – the event that defines credit risk - is largely out of the hands of the lender, because there is no control. A connected party's decision to default is typically determined by the lender because there is influence or control. (The exception is force majeure – see below.)
- It is part of – arguably the purpose of – the business of banking (and, to some extent, broker-dealing) to acquire third-party exposures. Intra-group exposures, by contrast, arise not in order to generate a risk-adjusted return but as a by-product of intra-group funding or risk transfer due to a centralised treasury process. A central treasury function is usually thought to minimise funding risks and costs. Such a function necessitates intra-group exposures as the funding activities are centralised at the treasury desk of the parent company.
- Firms can minimise the probability of default of affiliates by ensuring that they are adequately managed, and/or by down streaming funds. Put another way, in the circumstances in which an affiliate were to default, the group would have bigger problems than intra-group funding.
- It is not in the interests of firms to allow group entities to fail because of reputational risk.
- Firms have full and complete information about the financial standing of the group counterparty.

Centralised risk management of the entity means that firms will manage the ultimate exposures of the group on the same basis as that of the parent. The parent will be able to identify any problems at an early stage and because it has control it will be able to undertake a variety of actions to address the situation including managing down the exposures of the entity, transferring them, changing management. Since the focus is on managing the third party exposures of the group (upon which repayment of intra-group exposures depends), there is less need to focus on restricting the intra-group exposures themselves. As a result, respondents indicated that the exposures were usually not managed by

the credit risk function, but were monitored and/or managed by corporate treasury in conjunction with finance.

In terms of limit setting, most respondents indicated that these were driven by and constrained by the regulatory requirements in place, although the process of agreeing exposure limits may follow normal approval procedures.

As regulatory constraints drive the limits, respondents tended to indicate that exposures were measured according to the regulatory rules, i.e. using the more conservative measures.

Firms that allocate economic capital do not allocate economic capital against intra-group exposures. Of those two firms that commented on this, one firm stated that it structured its intra-group exposures such that they met the regulatory definition of exposures qualifying for 0% risk weight, i.e. that they regarded these exposures as very low risk.

In addition one firm indicated that it thought that the provision in Article 70 of the CRD that restricted the 0% risk weight for intra-group exposures to domestic exposures was inappropriate. It considered that treating cross-border intra-group exposures the same as third party exposures fails to recognise the risk mitigating benefits of a well managed integrated group.

In conclusion firms have a significantly different view on the risks associated with intra-group exposures than those of the regulators and strong incentives to take steps to avoid default. Both the risk and the benefits of intra-group exposures are wholly different. Firms believe that there should be no regulatory limits on intra-group exposures. However, if a limit is deemed necessary by risk-averse regulators, it should align more closely with the economic risk.

How do you approach the question of cross border intragroup exposures?

Perhaps the only concentration risk that applies equally to intra-group exposures is country transfer risk, which arises for reasons outside the control of either party. Most of those firms that responded indicated that country risk was taken into consideration in limit setting and that country limits sometimes posed an additional constraint on lending to group companies as such exposures were considered alongside other third party exposures to those countries. This was not a constraint on all cross border intra-group exposures, only those in countries where there was perceived to be non-negligible transfer risk.

One firm commented on more detail on its processes and indicated that the same policies and procedures were adopted for domestic and cross border intra-group exposures and that these were regarded as equivalent and saw no reason to distinguish them. However, it also indicated that it separately operated a country risk policy which will determine the amount of business a foreign subsidiary can undertake which will naturally reduce the amount of intra-group exposure.

In conclusion, firms do not believe that most cross-border intra-group exposures are different from domestic ones. In certain circumstances country risk may be material, but firms address this as part of their normal approach to country risk.

Look through (“Lifting the corporate veil”)

The credit risk in many transactions, ranging from guarantees through funds to complex asset-backed structures, depends on more than one party. This section considers how firms determine the counterparty when there is a choice. Very often the choice is between an underlying obligor and a protection provider; this

issue is dealt with in the next section. Another common choice is between a legal entity and the assets possessed by that entity, and that is the subject of this section. The latter approach is known as look through.

Respondents were quick to highlight the sheer number, variety and increasing complexity of the structures which they are required to assess. For many firms this has prevented them from developing a definitive set of rules for relationship managers and credit analysts to follow. One or two firms mentioned the relevance of past experience which is used to guide them and on which a number of group policies can be based. These policies often cover the more common and standardized transactions e.g. funds and fund managers, operational leases, etc. Other types of transactions covered in the answers included: asset-backed securitisations; leveraged buy-out transactions; leasing transactions; and project finance transactions.

Most firms adopt a case-by-case approach to new structures, with experts from group risk and the business units involved. It is important to note that for many of these structures the nature of the risks is subject to on-going review, either annually or when changes to structures or arrangements are advised by customers. Where possible firms seek to calculate the credit risk using existing credit models and measurement methodologies. If this is not possible a revised methodology will be developed and approved in line with the firm's model development and approval criteria.

Up-front deal evaluation is an especially important part of the credit risk process for complex structures. This analysis considers the structure of the vehicle and the underlying assets, e.g. *"...we would however look through the SPV to the underlying assets or sponsoring entity when assessing the credit worthiness of any proposal."* Analysis is undertaken to ascertain the nature of the transaction and to determine the economic substance of the structure, for example, to what extent a securitisation vehicle represents a more basic secured lending type arrangement. This analysis will often include identifying the sources of repayment, size and nature of credit exposure, tenor, the sustainability of cash flow generation, where the firm's recourse lies, asset quality and so on. According to one firm much will depend on the firm's right of recourse, e.g. whether an SPV is a standalone bankruptcy remote vehicle or whether there are alternative and/or secondary sources of repayment in place.

It is possible to say that in general "Special Purpose Entities" (SPEs) are kept separate and treated as standalone entities in a firm's credit system. However, where a transaction results in exposures to underlying reference names, such as in the case of a synthetic inventory exposure, these are likely to be captured under the relevant entity name. In the case of mutual funds, one firm described how the legal ownership approach is discarded, and where necessary the asset manager is separated out from the banking group to which it belongs and set up as a separate "group entity". The indirect principals are then set up as entities under the agent, even though they are separate legal entities. This was echoed by another firm who said that when trading with Investment Advisors, their credit policy was to link the exposures directly to the principal (fund) rather than the agent (IA). This firm based their assessment of SPEs on the creditworthiness of the assets supporting the structure and link the SPE to the ultimate risk party (e.g. the issuer of the bond held in the SPE) so that the association is captured.

In general most firms look beyond legal structures to identify the underlying counterparties. This helps ensure that counterparties are properly identified for aggregation and credit assessment purposes. When faced with the more complex structures it is the responsibility of the relationship managers and credit analysts

to identify the relevant parties in the credit structure and to assess the risks on those parties in accordance with normal credit requirements.

Some respondents talked about “ring fencing” their SPEs, resulting in credit exposure being assessed and managed exclusively based on the nature and quality of the underlying assets and the cash flows that these assets generate. As a result, the exposure to “ring-fenced SPEs” is usually assessed and reported on a stand-alone basis, unless a ‘look-through’ approach must be adopted.

One firm said that they do not generally adopt a look through approach to tranching structures as the first loss risk is not considered directly associated with the underlying issuers in a well diversified pool of assets. They went on to say that built in credit enhancement is supposed to cover the first loss position, although they do assess the financial condition, reputation and integrity of relevant issuers/sponsors. Some firms merely stated that they adopt a look through approach on a case-by-case basis, with one firm adopting a look through approach only where a third party credit support provider exists.

A further example is provided by one firm who outline the circumstances where a ‘look-through’ approach must be adopted for credit purposes as follows:

- The SPE, though ring-fenced and bankruptcy-remote, is owned and consolidated for accounting purposes by the seller of the underlying assets. Such an SPE will be reported as a subsidiary of the seller’s corporate group.
- The SPE is a stand-alone entity but recourse to a third party has been provided to the financing parties. Exposure to such an SPE may be “risk-shifted” to the third party’s corporate group, particularly where the ultimate credit decision relied more on the recourse to the third party than on the quality and cash flows of the underlying assets.
- The SPE is a stand-alone entity and no recourse to a third party has been provided but the quality of the underlying assets and the cash flows generated from these assets rely heavily on the continued performance of a third party (e.g. exposure to an owner of a very specific real estate object that is leased to a third-party). Exposure to such an SPE may be “risk-shifted” to the lessee’s/tenant’s corporate group, particularly where the real estate object has only little alternative use potential.

In the case of a securitisation, in order to assess the potential borrowing risks, one firm derives an internal rating for the portfolio of underlying assets using its credit models. They do this in addition to the usual structural, legal, operational, and sponsor quality review. This was echoed elsewhere in credit policies that assign SPEs/SPVs ratings consistent with the rating of the underlying assets. One respondent compared their look through approach to modelling the risks as if they held positions in each of the underlying assets. In another case, a firm said that for these types of structures they also consider the seller-servicor issues.

In other firms, economic capital models are used. These can sometimes be based on accounting rules, such as the US GAAP consolidation circle. Where no consolidation is required under the accounting rules the firm calculates and applies economic capital to the SPE, but where consolidation is required economic capital is calculated and applied to the underlying exposures. Other areas where a “look through” approach maybe adopted include in the economic capital calculation for market risk, where trades are made up of numerous underlying positions, such as in a standard index trade. Here, the decision to apply the look through approach is based on a number of factors, including data availability and system constraints. Internal modelling approaches often use the same current or Potential Future Exposure process as for single name exposures but aggregated at the appropriate level taking into account connectedness of the parties and/or

liabilities. One firm viewed the risks along these lines subtracting the current discounted market value of the underlying assets.

Another firm reported that they generally follow the national regulator's guidelines on the treatment of more complex transactions, and considered the following examples as within the scope of the question: lending to investment trusts; unit trusts; OEICs and venture funds managed within banking groups. They went onto provide the following further details: *"We follow the National Regulator's guidelines in determining whether the lending to an investment fund within the same banking group should be treated as 'connected' lending; or whether lending to several investment funds within the same third party group should be deemed to be 'related' (and therefore aggregated)"*. At this firm, any lending to an SPE which is part of a larger group is aggregated with any existing Group limits applied to the ultimate parent. Any lending to a bankruptcy remote SPE is recorded in the name of the SPE although as part of the sanctioning process once again consideration will be given to the claim on the underlying assets.

There are examples of where firms consider it inappropriate to record an exposure against the direct counterparty as it would not reflect where the true risk in the transaction lies. Consider a bank lending to a subsidiary XYZ and receiving a guarantee from its parent. To avoid double counting the bank sets a limit to cover the guarantee received from the parent, and the full face value of the guarantee would be included in the aggregated group exposure to the counterparty.

Indirect exposures

Indirect exposures were defined in the original questionnaire as exposures to the issuers of collateral or the providers of unfunded credit protection, with the implication being that concentrations could build up unnoticed unless monitored.

Industry practice is to largely only accept high quality collateral, such as cash and AAA government bonds, so the risk profile is very low. Firms reported that no losses had ever been incurred from the default of a major collateral issuer

However this did not stop some firms from reviewing certain types of collateral on an ad hoc basis, particularly from less well rated sovereign issuers, e.g. South American government bonds. Concentration risk incurred through unfunded credit protection is generally considered as a transfer of risk to the protection provider.

There appears to be no consensus on how indirect exposures should be monitored or aggregated. At least one firm suggested that the monitoring and managing of indirect concentration risk is not cost-effective as the concentration becomes evident only if all the primary obligors default at the same time. Another firm suggested that the systems hurdles were substantial, and limitations in the IT infrastructure make it difficult to identify indirect concentration risk. One firm compared concentration risk due to indirect exposures to settlement risk, describing them as "below the line" risk, and therefore subject to a separate level of credit authority. This firm, together with a few others, said that a framework for reviewing such risks was being considered.

A number of respondents however stated that indirect exposure is included in their calculations of the total exposure to the counterparty and included in internal large exposure guidelines. Similarly others reported that their economic capital models do not yet aggregate indirect exposures to the provider. However,

others were able to do this stating that they "*apply a risk transfer to the provider of the protection for guarantees or unfunded credit protection*".

At some firms, further reporting requirements are put in place with respect to credit derivatives, such as a monthly report highlighting exposures to key counterparties in relation to the credit derivatives purchased. A report like this can serve to highlight the amount of purchased protection from key providers, and the break down by rating of reference credit. It can also be used to monitor the top underlying concentrations by showing the largest single underlying counterparty exposure to each provider.

CHAPTER THREE

Tools for managing concentration risk

Firms can exploit an array of risk management techniques to understand and manage concentrations in their portfolios. These techniques or “tools of the trade” include limit setting, monitoring and reporting, stress testing, economic capital models, credit risk mitigation (including use of credit derivatives), active portfolio management (altering the firm’s product mix or target markets), asset sales (including syndications and participations), and securitisations. These are outlined in more detail below; however, the first line of defence is a clear, well-understood risk profile and risk strategy. As described elsewhere in this report, this enables the firm to address the issue of concentration at the point of origin.

Risk appetite

A firm’s risk profile and strategy will often take the form of an explicit policy statement, endorsed by the Board of Directors, clearly stating the organisation’s appetite for risk, along with desired portfolio compositions and targeted goals. The key issues at Board level are twofold: delegating authorisation to approve deal or sanction breaches; and setting high-level limits and allocating them to business units. In general the policy is likely to describe the amount of risk taking that is acceptable to the firm, setting a series of boundaries authorised by senior management within which the various divisions and business lines must operate. The management of the firm is responsible for aligning the risk appetite with strategy, and this typically involves considering the firm’s risk appetite in evaluating strategic alternatives, and developing tools to manage the related risks. Risk tolerances are also in place at some firms and these are developed at a lower level of the firm documenting the acceptable level of variation around the objectives. Decisions are made about the delegated risk tolerance levels for different parts of the business or for major transactions. This can help determine risk prioritisation in those areas and establish triggers for escalation of individual transactions that may exceed the agreed risk tolerance level. Firms with a documented risk appetite and risk tolerances can devote more effort and resources to those risks that might fall outside the firm’s policy, whilst resources may be freed up from devoting excess attention to risks that lie within acceptable boundaries. Operating within risk tolerances provides management assurance that the company remains within its risk appetite, which, in turn, provides a higher degree of comfort that, the company will achieve its risk-return objectives. Risk appetite is often communicated through the financial reports, quarterly and annual reports, press releases, investor calls, and so on. The firm’s risk appetite is implemented in practice through the setting, approval, and on going monitoring and reporting of risk limits.

Limit setting

Limit setting is a common way for the industry to manage concentration risks. Concentration limits can be defined in relation to a number of internal or external variables, such as capital, total assets, and, overall risk exposure.

Limits can be, and usually are, imposed at a number of different levels of the firms’ business (e.g. business unit, desk, portfolio), and can be calculated a number of different ways. Exposure measures typically follow one of two different approaches, usually reflecting the degree to which exposure is uncertain: a traditional approach based on notional outstanding and/or undrawn credit lines,

or a more risk sensitive approach based on either risk ratings or based on economic capital.

Governance

Procedures that cover concentration risk are a central part of all firms' approaches to managing credit risk. All respondents provided evidence of written policies governing the introduction of new business and monitoring of existing business covering the review, approval, or rejection of transactions that may lead to an unwanted build up of concentration risk. Governance is also about the allocation of responsibilities to risk committees and subcommittees and/or credit officers and much of the governance structure relates to procedures for deal approval and limit-setting. One firm neatly summed this up by stating that limit setting is a preventative control and the identification and monitoring of exposures are detective controls.

Who sets limits and why?

A firm of any size cannot be managed without extensive delegation and sub-delegation. The role of the Board is to set the strategy and set out high-level governance. The Board is likely to retain responsibility for approving changes to delegated authority. Modifications to the governance framework are in turn likely to be reviewed by some sort of risk oversight committee.

All survey respondents delegate limit-setting authority to a person or body. In general for large internationally active institutions this authority is held at Board level, often in the hands of a Chief Credit Officer or someone with a similar title, such as Global Head of Credit. In practice though, this authority will almost always be delegated down to a Credit Committee (or Risk Committee) and named credit experts or through a series of approval levels and reporting lines (although reported back to the Board). These individuals or bodies can be made responsible for the limits for individual counterparties. They are likely to consist of experienced analysts versed in risk management (credit professionals), independent of the business units, with a demonstrated knowledge of the product risks and counterparty analysis.

In some cases the head of credit has authority to approve exposures that are over agreed credit limits, for example 150% over the approved limits or for example where they are no more than 10% the aggregate level of the respective limits approved for the counterparty without extending maturity bands or conditions of previous approvals. In this case the internal limits are "soft" limits that can be breached without severe penalty; a breach may instead trigger more intensive monitoring and evaluation of the exposure. Many firms described scenarios where such exceptions to firm policy exist, and these are often managed on a case-by-case basis, at the discretion of senior management, and subject to further stringent reporting requirements. Depending on the size and circumstances of the exceptions, these may be included in reports that go up to a Board level (for more details refer to the section on limit setting and reporting).

How are limits set in practice?

As stated above, the preferred methodology for implementing and enforcing internal policies covering concentration risk is to ensure that potential risks are caught before exposures are taken on. In general this is achieved through incorporating in firms' systems the necessary risk data that can be monitored and reported on frequently. At one firm an electronic approval system calculates the required approval level based on the counterparty's rating and total limits assigned. The system then ensures that a credit officer with the required approval level has signed off on the limits before they are made live. In another

case the decision making for credit card transactions is also undertaken by automated systems using a set of policy rules. Where a decision is required for a group of accounts, it is possible to permit an excess on one limit where the overall outstandings are within a group limit, e.g. where offset or netting arrangements are in place (see section on netting). Where necessary contact will be made with the customer, prior to approval, or decline, of a transaction, to understand the reason for the excess and plans to address it.

Decision making at other firms can be driven by the judgement of the initial reviewer or escalated to an appropriate level for review and approval among delegated authorities. Other firms talked about risk appetite recommendations driving the decision making process, developed by risk experts and agreed at Board level. For example, *"Limits are set and reviewed annually as part of risk appetite within the overall annual planning process. The annual planning process develops a 3 year plan for the Group of which the first 2 years are regarded as firm and the third as indicative."* The extension and approval of credit risk to counterparties, issuers and countries at another firm was the responsibility of the "Individual Credit Authority". The system infrastructure at most firms captures, at a granular level, the approved limits for both groups and individual counterparties. This information is usually recorded at a facility level, e.g. an overdraft limit or a reducing term loan for an individual company.

Do all firms set limits for everything?

Limit setting is the key credit risk management tool for all firms. However, at least one firm indicated that for trading book exposures it did not set limits (in the traditional credit sense) ex-ante because of the liquidity of the instruments concerned which therefore gave the firm the ability to trade out of the risk with ease. However, this did not mean that there was not an approval process. Approval is based on the potential loss and level of risk in the concentration and the relevant approval authority can request an immediate reduction in the concentration at any time

A few respondents provided some details which included reference to maximum limits for intra day overdraft facilities. These were provided in one case to cover the risk position when payment is made on behalf of a customer, while awaiting a covering payment. This particular firm said that no further payments are made when the intra day overdraft limit is reached until the cover payment is received. Another firm talked about a "transactional limit" which was calculated at 100% of the notional. However, these firms generally perceived intra-day risk as having a lower risk profile, and therefore the limit may be viewed internally as a 'soft limit'

What factors determine single name limits?

Unsurprisingly, creditworthiness is the primary consideration for firms in determining limits to single names. As one firm put it 'creditworthiness of the counterparty is the cornerstone of any lending decision'. That said a range of quantitative and qualitative factors will be taken into account in reaching that assessment as is apparent from the existing body of work on the internal ratings based approach. One firm summarised these as follows:

- Purpose of the credit and sources of repayment.
- Current customer risk profile and its sensitivity to economic and market developments.
- Compliance with any applicable credit risk policy requirements, risk appetite statements and lending assessment guidelines.
- Compliance with affordability tests.
- Customer's repayment history and ability to repay.
- For business customers, the customer's position within a sector and the outlook for the sector.

- Proposed terms and conditions of the credit.
- Credit risk measures appropriate to the type of customer such as credit grade, Probability of Default (PD), Exposure at Default (EAD), Loss Given Default (LGD), and Expected Loss (EL).
- Risk-adjusted return.
- Adequacy and enforceability of any risk mitigation.
- The legal capacity of the customer to enter into the transaction(s) proposed.
- The legal and reputational risks associated with the proposed facility/relationship.

Firms undertake a formal analysis of the counterparty prior to entering into credit bearing business and this analysis will be reviewed periodically as part of the normal credit risk management process.

Counterparty type/industry sector is also a relevant consideration. Some firms indicated that they had different processes for approval for different types of counterparty (for example a split between corporate, banks, non bank financial institutions). Others indicated that counterparty type was taken account of through the obligor rating/grading system but that the approval process was the same. Further still others indicated that the regulatory treatment of different exposures may also have an impact in determining risk appetite. Additionally as in the case of intra-group exposures regulatory treatment may determine, or at least cap, the limit available.

- Size of counterparty was also cited by some as a factor in the limit setting process.
- As indicated in the section on look through, underlying assets may be a significant issue in determining the credit quality of the exposure and what credit limit is approved.

Tenor is mentioned by firms as another factor that will drive limits. One firm stated that it operated guidelines by tenor for its exposures to financial institutions, such that it would not expect exposures over 1 year to be more than 30% of overall risk appetite and exposures of over 5 years to be more than 10%

Other factors cited were:

- the existence of any legal agreements or credit risk mitigation arrangements in place (whether collateral, guarantees or other),
- type of product (in some cases firms were looking at tradability of the position),
- country/jurisdiction (whether there were transfer concerns or volatility issues such as in emerging markets)
- portfolio loss distribution profile versus risk appetite (i.e. portfolio effects recognised as part of a multi faceted approach to limits)

Are the limits absolute values or relative?

Some firms set limits in terms of absolute value. Others set limits relative to capital base (either a percentage of their own or the counterparty's). Some examples are as follows:

- Generally no exceeding of Risk Capital consumption over a EUR 20MM threshold per borrower group. Borrowers exceeding this threshold are monitored closely (risk assessment by Risk Management etc.) and reported in a separate "Large Risk Exposure Report".)
- Limit per borrower group to a maximum of 20% of the bank's own capital (internal counterparts) and 25% for external counterparts respectively

- For single name exposures it is total reportable exposure to a counterparty or group of connected counterparties equal to or greater than 10% of the relevant licensed entity's capital base. For other concentration risks within segments of business unit or divisional assets, it is exposures which absorb in excess of 5% of economic equity.

Are limits gross or net of credit risk mitigation?

Some firms set limits on a gross basis before taking account of any mitigants, others on a net basis.

At what level of the third-party group are limits set?

Firms set limits to counterparty groups in the most part. These are mostly either set at the group level (and may be allocated to individual entities within the counterparty's group) or individual limits are set for the individual entities and the group limit is the aggregation of these individual limits. Although one firm indicated that it would depend on the customer's needs. Either a group limit would be set and allocated, or limits would be set at an individual entity level. For this firm in both cases the limits would be approved at the level appropriate to the overall exposure level. Some firms also indicated that they set product limits within the single name limit (e.g. loans, foreign exchange derivatives, equity derivatives etc).

At what level within the firm are limits maintained?

All of the firms who commented stated that limits were maintained at a group level, but not all of them had limits set at an individual entity level. Predominantly firms set the limits at a group level and allocated down – although not necessarily by legal entity. Some firms indicated that they allocated limits to business units (i.e. parts of a legal entity), or business clusters (i.e. businesses lines that span more than one legal entity). Additionally some firms allocated to sub-groups. In other words, the group perspective is of prime importance to firms. Beyond that firms will organise themselves according to their business needs without necessarily following legal form. There was no discernible difference between investment firms and banks in this respect.

One firm indicated, however, that it set a policy at a group level within which individual entities would set their own policy and their own limits. For that firm, the group limit would then be the aggregate of the group members' limits.

Limit setting and management of other concentration risks

How are other portfolio concentrations managed?

Firms use a variety of methods to identify and manage portfolio concentrations. Limits are used, but not by all firms, and are supplemented by other risk management tools. These differences reflect the differing risk appetites, business models and resulting portfolios, which make particular concentration risks more or less relevant. The following examples were identified:

- Three firms used their economic capital models to assess portfolio concentration risks by industry sector and country. One indicated that it used expected shortfall measures for risk reporting and management purposes. One indicated that aggregated exposures that absorbed 5% or more of economic capital are tracked and reported to senior management. This firm also indicated that it reviewed by product and credit rating.
- One firm identified emerging market country risk by developing emerging market crisis scenarios that assume asset price falls, currency devaluation and credit impairment in the event of a crisis. Exposure limits are set at the country and regional level.

- One firm indicated that trigger limits are developed, based on a percentage of group profits for industry concentrations. These limits were assessed against the provisions charge resulting from stress testing.
- Another firm indicated that country LGDs were developed which were factored into the limits to entities in those countries
- One firm indicated that it used Credit VaR and scenario based stress loss methodology
- One firm indicated that it had developed a country status list and reviewed country exposure for all of those in the high risk category and all emerging market exposures. Particular approvals are required for exposures to countries in the high risk category.
- One firm indicated that it had developed a framework of limits for rating and maturity band for each exposure class. Exposures above the limits had to go through a separate approval process. A similar framework had been developed for country risk.
- Finally some firms also indicated that ad-hoc reviews of particular sectors etc are also be undertaken at the request of management

Are there other portfolios where limits are commonly used?

Limit setting is quite common for country/geographic risks. That is not to say that all firms use limits for country/geographic risks, or, that those firms that use limits set them for all country/geographic risks. Where limits are set they are unsurprisingly a function of the perceived level of risk of that location and the firm's risk appetite. Factors identified by one firm were as follows:

- Sovereign risk rating
- Probability of default
- Past experience with the country
- Current political and economic environment

One firm indicated that it uses the lower of two threshold calculations. Firstly countries are allocated to a six category scale – prime, normal, fair, case by case, restricted or constrained. Limits as a percentage of capital base are then set for each of these categories. The second threshold is calculated based on the foreign exchange receipts of that country. This threshold is not only based on the country's classification within the six, but also takes account of the degree to which the firm has a presence within that country and the extent to which debt payments are a charge on the foreign exchange receipts.

Monitoring and reporting

Monitoring (both for single exposure and for other concentrations) is required to ensure exposures are in line with the firm's risk appetite and if they are not, that the appropriate actions are taken, such as revising caps on exposures, obtaining mitigants, requiring more senior approval for risk areas identified etc.

Where there are controls and procedures in place for exceeding limits, it would be fair to describe them as "soft" limits, e.g. where a breach has been pre-approved. At some firms only limits to certain counterparties can be breached, and these may include banks, non-bank financial institutions, governments, and intragroup exposures. It is often the job of a separate team within the firm (a credit control team) to investigate the circumstances behind limits that have been breached (was pre-approval given by the relevant authority? etc.). In most firms where approval has not been granted in advance, reports are escalated very quickly, perhaps to the trader's manager or Chief Operating Officer. Senior credit officers will also be advised.

It is clear then that at all firms monitoring and reporting play an essential part of the governance framework covering concentration risk. Monitoring is done to

ensure that if a limit is exceeded (“limit excess”) or large exposure guideline breached, or there is a regulatory limit issue, then the relevant credit authorities within the firm are made aware and the necessary action can be taken. At all firms the consequences of failing to comply with credit limits will be well documented in firm policies and procedures.

The frequency of the monitoring will often depend on the likely impact of the “limit excess”. In many cases exposures are monitored daily (sometimes referred to as “routine” monitoring) and for large exposures this will almost always be the case, to ensure that any issues are promptly identified and the value of collateral is preserved.

Daily monitoring is common elsewhere, for example for revolving credit limits, such as overdrafts, for trading book exposures, and for country risk. For other limits monthly monitoring is generally deemed adequate unless utilisation is very close to a limit in which case special arrangements may be adopted. This is more common for term loans, where reducing limits maybe monitored less frequently. It is also likely to be sufficient for sector analysis, where whole portfolios are assessed in detail. There may also be cause for firms to instigate specific monitoring as a result of a special event (“hot spot analyses”, for potentially volatile countries, sectors or groups of counterparties), and this is often coordinated with the risk management function at the firm.

Individual transactions are monitored to ensure agreed limits are not exceeded. Some transactions that may lead to a breach can still be considered for sanction, and many firms will have additional conditions and procedures that may apply to such trades. For example Board level monitoring on a more frequent basis may apply. One firm said *“Breaches of monitoring levels for industry concentrations are escalated at different levels in the organisation (CFC up to CFO) depending on which threshold is breached.”*

Reporting

Regular reporting within the credit risk management framework is an important tool used by firms seeking to capture and understand concentration risks. Reporting plays an important role alongside governance in a firms’ credit risk management framework. In particular, regular and frequent reporting enable a firm to capture and better understand concentration risks. As you might expect reporting concentration risk takes on a variety of guises across the industry, with detailed reports on individual cases (“limit excess”) and regular more routine reporting defining the range. In general the regular reporting that goes on contains the details of the monitoring described above, including the monitoring of limits and approvals.

Senior management reporting also occurs at all firms under different scenarios and at regular intervals, which vary from daily to weekly to monthly and beyond, depending on the specifics of the concentrations being reported. Examples of what can be included in the reporting are:

- the limits
- exposure levels
- capital usage
- excesses
- limit breaches
- “top 20” schedules
- overall portfolio exposures by rating, industry, product etc.

For example, one firm monitors emerging market country limits weekly. Reports to senior management will vary according to the nature of the counterparty and

the exposure but are more likely to be of the exception type where larger or longer outstanding items are identified.

By way of example internal reporting could cover any of the following items:

- Clients exceeding the EUR 20mn Risk Capital threshold;
- New lending business, including the largest new loans;
- Portfolio concentration analysis by size class, maturity, region and sectors in case of any significant changes since the last report;
- Each industry sector analysed at least once a year by sector-specialists, including largest loans, concentration by region, size class, and maturity.
- Quarterly reporting of stress tests by product highlighting the most sensitive single names to specific risk factors
- Results of non-systemic stress tests on specific sectors and sector limits
- Weekly single name report showing top investment and non –investment grade names on a jump to default basis.

Breach reports may also include details about a limit breach, the time since the breach occurred, and any sanctioning or approvals given or required. Alongside these specific reports information is also reported on how problem accounts are being managed and on the firm's provisioning policies. Other reports compiled at a number of firms on a portfolio basis include the "limit excess" broken down by product type, geography, security coverage, and days passed due or other appropriate criteria.

These reports are often compiled less frequently and targeted at senior management or Board level discussions. Often the portfolios, or sectors covered will change over time, reflecting the performance of each sector and the levels of exposures maintained by the firm.

At one firm they described an annual review of concentration risk performed on a per-industry basis, combining industry and risk portfolio reviews with a review of the largest counterparties in each industry and the determination of an industry risk appetite. This review results in strategic decisions for each sector for the following year, which is reviewed and approved by a senior risk committee. Other firms described a similar process which they went through at least once a year looking in detail at single name, regional, size class and maturity concentrations for each industry sector.

Although limit monitoring is a frequent activity at most firms, reporting to senior management may be less frequent. Some firms reported on a monthly basis, e.g. "*the monthly large loan report*" covering all counterparty groups where regulatory exposure approaches or exceeds the large loan threshold of 10% of the firm's capital. Or as in another case "*A schedule of LE names is included in the quarterly information packs circulated to Senior Executives*". In other cases more details were provided monthly including new lending business and portfolio breakdowns by industry size class, maturity, industry sector, and region. A few other firms provided further details to management on a quarterly basis, sometimes reflecting regulatory requirements in a particular jurisdiction. At one firm they described a summary report produced quarterly containing analysis on usage against all limits. Other firms provided senior management reports on a half yearly basis covering the largest exposures to banks, corporates, and cross border exposures, including breakdowns across sectors (aviation, shipping, insurance, automotive, credit cards, real estate, and asset backed securities).

How long have firms used their approaches to manage concentration risk?

Firms indicated that their approach to single name risk is well embedded into the risk management framework and has been for a number of years. In some cases this has been in place for ten years or more, albeit subject to refinement.

Approaches to portfolio concentration risks appear to have evolved more substantially over time, although in many cases these too have been in place for a number of years. Stress testing as part of the framework has developed more recently, particularly on the credit side.

Those using economic capital models tend to have developed and implemented these systems more recently (over the last 5 years), with a number of firms in the development phase and others considering them. A few firms have been had them in place for longer, and in some cases for over 10 years.

Measurement of exposures: amount at risk

The measurement of credit risk varies by product. A few firms outlined an overview of their approach which was not product-specific, including those firms who seek to calculate for each transaction an Exposure at Default (EAD). Where an EAD is used, firms prefer to use the same EAD, where possible, as that used in the calculation of regulatory capital under an IRB-AA approach. Some firms with economic capital models will prefer to use their own internal estimates of EAD. At one firm, they described their approach in terms of notional risk, with four measures of notional risk in place: current (exposure today); loan equivalent (likely exposure); deemed (worst case); and maximum. Another firm sought to measure exposure for all products as 100% of the gross nominal amount of the credit obligation, unless another methodology had been approved by the group risk function. But apart from these few examples most respondents outlined a different approach for each product type, and these answers are summarized below.

Retail exposures

A few firms measured a range of retail type exposures using an approach based on Loss Given Default. These included commercial loans with undrawn facility limits (using differentiated k-factors), guarantees and other collateral (based on recovery values). Where some firms referred to a potential future exposure (PFE) method, for a similar type of exposures this generally resulted in the notional amount of the facility. However, in general and consistent with long established accounting practice loans and undrawn facilities are booked at par, along with guarantees, which are often reported as contingent liabilities and booked at face value. There were a few firms who referred to possible adjustments that they would make for any perceived asset quality deterioration.

Loans and undrawn facilities

The measurement of exposures created by straightforward loan facilities varied among our respondents. The methodology would also vary depending on what purpose the exposure was being measured for. In particular for internal sanctioning purposes a limit is likely to be based on the full face value of the loan, while for economic capital purposes an EAD is often used. For some firms the only "at risk" position for an uncommitted loan facility was considered to be the drawn portion, and this was reflected in all those answers that specified that for the current exposure this was measured as 100% of the outstanding or the total commitment. Where a committed facility has been approved, then the authorised limit will represent the maximum risk for the firm, whether fully, partially, or totally undrawn. At other firms a loan equivalent or credit equivalent amount is

used, which includes an estimate of expected draw downs. Other respondents referred to notional amounts after mitigation, with one firm looking at the total financing limits excluding cash collateral.

The majority of firms reported using similar measurement techniques for loans and undrawn facilities, consistent with those outlined above. One firm stated that as they are committed to providing the full face value of the exposure then for measuring purposes the full face value, whether drawn or undrawn is considered. However, a few specified that they consider only the drawn portion as an immediate risk position, with one firm stating that as a measure of current exposure they do not include any part of the undrawn facility in their calculation. Others specified that for reporting purposes only the outstanding borrowings are reported.

The credit equivalent amount approach considers an estimate of expected draw downs.

Guarantees and similar obligations

A number of respondents stated that their approach to measuring exposures for risk assessment purposes for guarantees and similar obligations was no different to that for loans and undrawn facilities. Although contingencies are generally parameterised differently from loans due to their draw downs being conditional on an event other than default. One or two firms said that they use an LGD type approach for looking at the recovery values for guarantees. Others referred to using their credit risk models and PFE, which for guarantees results in the notional amount of the facility. In some circumstances another firm suggested that it could be less than the notional "*if the underlying obligation is permanently reduced*". A few firms talked about guarantees being reported as contingent liabilities and measured at their face value (100% at risk).

Derivative Exposures

We include in this section both Repo style transactions and other securities financing trades, as the responses did not highlight any discernable differences in their treatment and the way derivative exposures are treated. The majority of firms referred to their credit risk models when discussing the measurement of derivative exposures for the purpose of setting and monitoring internal counterparty risk limits, with the most common answer involving the use of a measure of future exposure (FE). A distinction was drawn between FE measures used (i) for setting credit limits and (ii) for calculating counterparty risk economic capital. There is strong commonality in the approach firms take to setting counterparty risk limits in portfolios of OTC derivatives and securities financing transactions. In both cases the measure of exposure used can be described as "peak exposure", evaluated at a percentile somewhere between 90% and 99%. For example one firm said that "*For Derivative transactions 95th percentile Potential Future Exposure (typically based on Monte Carlo style simulations) is the primary metric, but we use 99 and other confidence levels as well as stress testing*". Another firm described the process as calculating the maximum future mark-to-market value of the portfolio, calculated at a given confidence level, usually above the 95th percentile. In general unsecured exposures are measured on a time to maturity basis, while the time horizon for collateralised positions will reflect the nature of margining agreement in place. Where daily margining applies, the liquidation period varies between 1 and 15 days, and is shorter for securities financing trades (typically between 1 and 5 days) than for collateralised derivatives trades (generally approximately 10 days).

In at least one case, where there were low trading volumes they allowed a measure of exposure using just a percentage of the trading notional value. This

however was still marked-to-market on a daily basis with “add-ons” applied on a trade-by-trade basis to reflect the tenor of the trades. The same firm noted that where trades involve opposite positions in a single risk factor, only the larger exposure would be considered. They also went on to note that the “add-on” percentages are re-assessed semi-annually based on a minimum of three years historical data plus an assessment of current and future market conditions.

Other measures of exposure were used for different purposes, such as mentioned above in the calculations for economic capital. Here, industry practice increasingly converges towards an Expected Positive Exposure (EPE) based standard. For derivative portfolios the majority of respondents use EPE or a more conservative loan equivalent exposure for measuring FE, which is considered to be conceptually the same as EPE. Some firms adjusted EPE upwards to take into account counterparty credit quality and/or concentration risks. In other cases the EPE was said to be too conservative due to its implicit roll-over assumption.

In general firms apply the same modelling methodology for both setting limits and calculating economic capital, and for portfolios of derivatives these centre on Monte Carlo simulations. Where it is not currently being used, firms mentioned their intention to move to Monte Carlo based models in the near future. Less elaborate modelling is employed for funding transactions and these include historical simulations, variance-covariance and marked-to-market plus add ons.

Impact of netting

In nearly all cases derivatives exposures are calculated on a net basis, i.e. the impact of netting and collateral agreements is included as part of the exposure simulation. Some firms also considered purchased protection in the exposure measurement though not in every circumstance. For a transaction or portfolio managed under a Credit Support Annex or equivalent, the exposure profile reflects the beneficial effects of all collateral and this produces a lower credit risk exposure profile. Going forward firms hope to achieve a higher degree of netting through the use of more cross product netting agreements, such as the ISDA bridge agreements. Beyond the netting of current market values, firms are increasingly focusing on the netting of future exposure, and this is likely to become easier through the use of a common measure of FE such as EPE.

Structured transactions

Often there is no difference in the measurement techniques used for derivatives above, and those for structured transactions. On the whole structured products are disaggregated and treated according to their component parts. Depending on the structure this could involve separating out a derivative from a host (usually some form of debt) instrument. Calculating the relevant exposure will therefore require a combination of the other categories’ methodologies. Often for highly structured transactions these methodologies will be designed on a case-by-case basis. For example, one firm described the approach they took as being based on a “sum of parts” methodology. The Factors outlined that firms consider in developing the right approach include:

- The underlying transaction structure and purpose (e.g. client, counterparty or market risk mitigation, balance sheet management, credit structuring, credit or capital structure arbitrage, tax efficiency, etc.);
- The relationship between transaction parties and risk transfer between them;
- The Underlying collateral (e.g., specific asset or granular collateral, cash flow or asset backed); and
- The tenor risk, basis risk, correlation and “right way round” risk.

However, one firm did state that for exposures to tranching structures such as securitisations and CDOs they generally aggregated them at the legal entity and not the tranche level. The stated rationale for this was to record exposures common to the underlying collateral regardless of capital structure.

Intra-day exposures

It was unclear what information on industry practice the regulators were seeking in respect of intra-day exposures. Not all firms considered intra day exposures in their assessment and measurement of concentration risk. A couple of respondents provided some details which included reference to maximum limits for intra day overdraft facilities. These were provided in one case to cover the risk position when payment is made on behalf of a customer, while awaiting a covering payment. This particular firm said that no further payments are made when the intra day overdraft limit is reached until the cover payment is received. Another firm talked about a "transactional limit" which was calculated at 100% of the notional.

Settlement exposures

Firms described different approaches to estimating the amount of exposure at risk pending settlement of a transaction. Some firms did not consider this at all, while others highlighted a particular risk associated with foreign exchange trading, where daily settlement limits are established in addition to peak exposure limits. This type of risk is similar to that of intra day exposures and was described by one firm as representing "*the amount paid in one currency in relation to the settlement of an FX transaction while still awaiting receipt of cover in another currency*". Limits are often in place to cover the maximum settlement risk permitted on any given day. Limits are likely to consider the full face value of the settlement exposure. Another firm calculated the "*risk as the USD equivalent of the amount receivable, aggregated on a per settlement date basis*". In one further instance to assess settlement exposure a firm ran Monte Carlo simulations for counterparty portfolios with different currency pairs and at least one currency option. Where there are no options included in the portfolio then settlement exposure is measured with a simple aggregation of notional amounts. Settlement exposure can also arise on transactions settling free of payment, and here it is likely that pre-approval from credit will be required in order to secure the notional amount of payment.

Credit risk mitigation

Credit Risk Mitigation (CRM) is integral to determining exposure amounts for risk management purposes. Generally CRM techniques are used to reduce exposures for risk measurement, monitoring and management purposes. Techniques are often applied where exposure without these techniques would be significantly above the firms' credit risk appetite. The rationale of CRM is therefore primarily to reduce and/or eliminate risk in certain transactions and also where conditions are met to reduce economic and regulatory capital. It is easy to see why then all firms in our sample use CRM techniques.

The results of the report show that different CRM products tend to be available and/or economically feasible in different markets and for different borrower types. Further the extent and nature of available mitigation will often be discussed with the customer, assessed as part of the credit approval process, agreed and subsequently documented. When taking mitigation the prime consideration is to ensure that if and when required the mitigant will deliver the expected level of reduction to potential losses e.g. the sale proceeds of a property will be sufficient

to cover outstandings on a mortgage loan even allowing for a downturn in property prices and the need for a forced sale. This requires legal certainty and enforceability so that the bank's ability to take possession of and sell a mitigant can withstand any legal challenge. In addition there must be an appropriate valuation of the mitigant up front and on a regular basis thereafter.

A variety of techniques are used to reduce single name concentration risk. These include, the selling of loans in the secondary loan market, securitisation of loan asset portfolios, collateral (through entering into "Collateral Support Agreements", where either cash or liquid securities are pledged, such as an ISDA CSA), credit derivatives (buying protection in the credit markets, although this will not result in a reduction of concentration risk from a regulatory large exposures perspective), total return swaps, netting in the trading book (and the conclusion of offsetting trades in order to reduce derivatives exposure to a counterparty), close out netting under ISDA agreement, third party guarantees (recourse to third parties allowing a risk transfer to the guarantor), early termination options (such as mutual break clauses that effectively reduce credit equivalent exposure by reducing the tenor of the trade, e.g. a 10-year swap but with break clause in year 5), and certain types of insurance. These are discussed in more detail below.

The use of these tools can be adopted by each individual business line, or driven by a dedicated business division. In one case a separate group within the credit risk framework has responsibility for two primary initiatives "*to reduce single-name and industry credit risk concentrations within the credit portfolio*", and secondly "*to manage credit exposures actively by utilizing techniques including loan sales, securitization via collateralized loan obligations, and single-name and portfolio credit default swaps*". In other cases a group function is responsible for reviewing the level of credit risk and the structure of facilities with a view to considering additional CRM techniques. A group function may also be responsible for the many different types of credit risk mitigation taken. This may include ensuring mitigants are able to cover all or part of outstandings in the event of default and whether those mitigants are eligible for capital reduction purposes. The group function might also cover the managing and monitoring of mitigants including both funded and unfunded mitigants. This could involve looking after physical assets, such as property, plant and machinery, vehicles, ships, aircraft, etc., financial assets, like cash, bonds, equities, etc.; receivables – debtors or other receivables; and guarantees – these will include parent or other related companies, insurance companies, banks, government entities, etc.

There is a difference to the way CRM is dealt with in the banking book and the way that it is managed in the trading book.

Banking book

In the banking book it is more likely to see credit exposures calculated on a gross basis, with little or no recognition of any netting affect. At one firm they reported that although both guarantees and credit derivative protection is sought to manage the quantum of risk weighted assets in the Banking Book, credit risk numbers continue to be calculated on a gross basis both for internal and large exposures regulatory reporting purposes i.e. no CRM benefits are recognised for internal risk management or regulatory purposes. At another firm they use Credit Linked Notes (CLNs) to manage risk in the banking book.

In order to manage the exposures resulting from core lending activities in the banking book, some firms incorporate the recovery values for collateral (depending on collateral type) and guarantees (depending on the guarantor's rating) within the calculation of LGD values. In these cases no correlation between obligor and guarantor is taken into account.

Trading book

In the trading book firms use sophisticated credit models to manage counterparty and issuer risk positions. Here, the correlation between issuer and guarantor is often reflected in the model. The availability of netting agreements can be taken into account within the simulation of expected future exposure. The focus of this simulation is explicitly on the margining process, depending on predefined thresholds. Existing agreements specifying the delivery of collateral in the case of rising exposures can be simulated separately, and would focus on explicitly on the margining process. Also in the trading book synthetic bond positions can be created to cover bought or sold protection from credit derivatives. The off-set between long and short bond positions is defined at one institution within a separate policy. Counterparty Risk against the protection seller (guarantor) is likely to be reflected as a separate position.

CRM Techniques

Collateral

Collateral is held to reduce the reported exposure. In general the amount of collateral held is calculated as part of either initial or variation margin. Collateral associated with variation margin is used to reduce the mark-to-market exposure, whereas collateral held due to initial margin is used to directly reduce peak exposure. Collateral that is not effective for regulatory purposes maybe accepted, but the relevant regulatory systems will identify and exclude all such collateral from the relevant regulatory calculations (so no capital relief is taken for ineligible collateral). In such cases the recognition of risk mitigation for internal purposes is likely to be driven by the firm's internal policy with regard to the collateral's price stability, market liquidity etc. However, this collateral is less likely to be accepted for those names reportable under the Large Exposures regime.

It is clear from the responses that the vast majority of the collateral paid and received is either cash or high grade government debt. For this reason for the majority of respondents correlation risk and concentration risk are not major concerns. Industry models capture the terms of each collateral agreement, including the threshold, minimum transfer amount, valuation frequency, etc and the models will determine the amount of collateral paid and received at each time point under each scenario. One firm said that although they deliver collateral as soon as it was called, they assume collateral that they call takes a week to arrive. This approach is used by the firm to calculate the 95% worst case exposure profile net of collateral.

The general principle is that collateral asset values must be independent from the counterparty risk and very liquid in all possible scenarios in order to be considered suitable for reducing single name concentration risk. As a result, collateral that fulfils these criteria is usually cash or highly liquid government bonds. All other collateral (e.g. lien on real estate assets, assignment of receivables, pledges of shareholdings) can generally not be applied for reducing single name concentration risk but may still be providing additional comfort.

Collateral haircuts

In general "haircuts" are applied to non-cash collateral to factor in the price volatility of the collateral. Haircuts can be applied to cash collateral where the cash held is in a different currency and a margin is applied to cover the volatility in the foreign exchange markets. On the whole firms said that haircuts are applied on the basis of past experience, on expectations of future movements, and the level of credit risk appetite. A good example of the latter would be a firm that in normal circumstances policy may indicate a maximum loan to value of

80% but this may be moved to 85% when property prices are increasing and expected to continue to do so. Respondents reported increasing use of historical data to determine haircuts, e.g. through the application of actual loss data by mitigant. Haircuts will also depend on the re-margining frequency and the residual maturity of the instrument. Under most internal and external guidelines (national rules and regulations), securities used as collateral must be marked-to-market on a daily basis. Examples of haircuts applied include: -

"Non cash collateral received is discounted by a haircut based on a 10 day holding period and 99% confidence level"

"..Zone A central government, central bank and multilateral development bank securities we apply a haircut of a maximum 3 day price movement observed for each instrument over the last 10 years"

As one firm put it, by increasing the haircut you reduce LGD benefit and create incentives to obtain collateral likely to benefit from flight to quality (e.g. treasury securities).

Where there is correlation between asset values and events, this will often be factored into the haircuts which will differ between collateral types. Care is taken when accepting mitigants to ensure that the level of correlation risk between the counterparty and the mitigant is minimised e.g. *"we would not lend to a company against that company's own shares"*. Others did not consider correlation to be an issue given the type of collateral being held in most cases i.e. *"95%+ of our [sub-group] collateral is held in the form of cash and government securities (US Treasuries, UK Gilts and Euro government bonds)"*.

Netting arrangements

Netting agreements are used to reduce credit exposure and are based on the existence of a legal agreement (e.g. ISDA master agreement) and positive legal opinion around the enforceability of that agreement. Where an opinion exists then positive and negative exposures can be offset for all transactions covered by the relevant agreement. It was widely reported by respondents that due to constraints around the recognition of netting for regulatory purposes (such as regulator permission, netting between banking and trading books, and netting between on and off-balance sheet items), separate processes are required for credit and regulatory exposure calculations. Although one firm did say that their internal netting was consistent with regulatory netting, another firm explained in more detail the reasons why differences may exist: *"Under Basel 1 for regulatory purposes an "independent" legal opinion is required for netting to be recognised. For risk management and US GAAP purposes a sound "internal" legal opinion is acceptable. Therefore net exposure for regulatory purposes and risk management purposes differs."* It was pointed out that under Basel 2 the same enforceability standards for risk management and regulatory purposes will be applied. Another firm said: *"We make widespread use of netting and collateral agreements, generally those produced by ISDA, which cater for close-out netting and dynamic margining of derivative portfolios."*

Legal certainty is the key feature of firms' ability to net exposures. Each firm is likely to conduct a thorough legal due diligence process to confirm any agreements enforceability. The key principle is legal enforceability; if it is enforceable, on the whole firms do not consider relevant other factors such as whether the transaction is on versus off balance sheet. The main difference reported is that, credit derivatives are not allowed to be netted for regulatory purposes against exposures traded under the same ISDA Master, a rule that at least one firm viewed as senseless. One firm said that this can generate fairly large differences.

Netting is applied to both mark-to-market transactions and collateral. Where more than one transaction falls within the scope of a close-out netting agreement, it is common industry practice to net mark-to-market values against counterparties. At one firm the Credit Equivalent Exposure (CEE) is calculated for the netting set and takes into account the market risk portfolio effects on the set of trades. At other firms the difference between net and gross exposures at counterparty and jurisdiction levels are calculated.

Credit Derivatives

Credit derivatives (in particular Credit Default Swaps and Total Return Swaps were mentioned) are actively used by the majority of respondents as a credit mitigation technique. Where CDS are purchased although they can be considered a CRM technique it was highlighted that such a risk management tool would not reduce single name concentration risk from a regulatory large exposure reporting perspective. Credit derivatives for protection purposes are not always taken into account for regulatory purposes (yet) but are generally transacted with highly rated banks (and falling under collateral agreements).

Firms were keen to point out that the new CRD will mean that for regulatory reporting of Large Exposures for capital purposes firms will be permitted to estimate the portfolio effects on derivative exposures within netting sets. One firm provided the following illustration of how credit derivatives are viewed:

“In establishing approval for transactions credit approval may be given on the basis of a certain amount of final exposure. This target exposure may be reached through selling down participation in a transaction or through the use of credit derivatives.”

Guarantees

Guarantees are used to reduce concentration by transferring risk from the obligor to the guarantor. The transfer of risk is only made if the guarantor has a higher internal rating than the obligor. These can be provided by parent or other related companies, insurance companies, banks, and government entities. Generally guarantees from third parties are accounted for on the basis of the notional amount of the guarantee. It was pointed out by one firm that for Large Exposures purposes only bank guarantees are recognised providing the guarantee is direct unconditional and irrevocable. The same firm however did say that in exceptional circumstances other non-bank guarantors may be considered. In general guarantees affect the internal ratings of the exposure, not the size of the exposure. Guarantees are treated differently from credit insurance which is also used to transfer risk. In the case of insurance only 90% of the amount insured is transferred to make allowance for legal risk around the possibility of non-perfect documentation.

Measuring funded credit protection

Examples given of funded credit protection include cash, negotiable government bonds in domestic currency (G14 countries only), US mortgage agency paper, letters of credit from a G14 bank rated A+ or better, supranational or “jumbo” Pfandbrief debt, equities for securities financing and prime brokerage, but increasingly also other asset classes (including fixed assets) are considered, and any eligible collateral under national rules, providing it meets the regulators conditions.

On the whole the value of this type of collateral will depend on a haircut determined by collateral asset volatility, frequency of margining, and the jurisdiction where the collateral is to be held. Valuations will also consider the historical volatility and frequency of which it is marked-to-market. Some firms

offset the collateral against the exposure, perhaps on an after haircut basis *"where the collateral is acceptable, and the appropriate documentation is in place, we deduct the value of the collateral from the exposure."* While others said that they do not reduce the notional measurement due to collateral, but reduce economic capital via loss given default parameters.

Top slicing approach

This approach was defined by CEBS as to mean the use of credit protection to reduce the uncovered part of the exposure to a particular level e.g. the internal limit. This approach is discouraged by some regulators, and not recognised by the majority of firms (e.g. *"CDS purchased can generally not be offset against financing limits, i.e. limits are always reported on a gross basis even if 100%-covered by CDS."*), however, some firms did admit to using it.

More generally, it was clear from the answers given that in accounting for CRM techniques measuring risk is done on a net basis, but when considering credit appetite this can be determined on a net or gross of mitigation basis e.g. for Hedge Funds, credit risk monitoring is done on a gross and net basis.

Measuring unfunded credit protection

Examples of unfunded credit protection include CDS, guarantees from banks relative to fronted L/C exposure, mono line wraps, government guarantees (e.g. import/export programs), and financial guarantee insurance policies. These types of protection are used to reduce borrower exposures to acceptable levels of risk and to bring them within approved limits. The form and amount of protection will depend on the business type and borrower type in question. This often enables a firm to do business with borrowers they would otherwise not be dealing with (e.g. low rated borrowers).

For Large Exposures purposes guarantees are recognised providing the guarantee is direct unconditional and irrevocable. A variety of techniques are used for measuring the impact of unfunded credit protection. A common approach is the substitution approach whereby the exposure to the obligor is reduced by 100% of the protection and the exposure to the protection provider is increased by the amount of the protection. There are exceptions to this approach such as where an exposure to a corporate client is guaranteed by another entity of the same client group (e.g. the parent company) and under such circumstances, a firm would still record the exposure to the borrower but as a guaranteed exposure with the same default probability assigned to the borrower as to the guarantor.

Other firms talked about factoring in the double default effects using a "risk factor" (less than one) which the exposure to the guarantor is multiplied by. The size of the risk factor would vary by obligor rating and tenor. One firm said that they either use a substitution approach or apply double default treatment depending on the quality of the CRM product and protection provider. Another firm mentioned a "Joint default simulation" approach, also factoring in double default effects.

Correlation between the credit quality of protection seller and events leading to the default of the counterparty

Although a number of firms did not provide details on the possibility of correlation effects between the credit quality of the protection provider and event leading to the default of the counterparty, others were keen to show that this was considered as part of their overall credit portfolio model. Perhaps those that did not respond maintained a similar firm policy to the firm that stated *"the general principle is that we buy credit protection only from counterparts whose credit quality is not correlated to the credit quality of the underlying borrower."*

However, those that modelled these effects in multi factor credit portfolio models saw the credit relief benefit reduced and in cases where there is high correlation between borrower and guarantor no credit relief given at all.

Suppliers of mitigation tools

In general all firms will have policies in place to determine use and on going support of CRM activities. These policies are likely to differentiate the various protection providers by credit quality, the typical nature of their business and familiarity with CRM tools. The level of recognition is likely to depend on for example, the credit quality, correlation and trade structure. In general the credit exposure to the credit protection provider is accounted for in the trading book against traded assets inventory limits, the size of which usually depends on the credit quality of the credit protection provider. Buying credit protection is a form of transferring credit risk from the underlying borrower to the credit protection provider, and at least one firm compared it to their loan hedging policy that defines the minimum internal ratings for their hedge providers. Broadly speaking, as one firm put it, in the case of guarantees:

- the guarantee must be explicit, irrevocable and unconditional;
- the guarantee must be legally enforceable;
- the guarantor must have an acceptable credit standing, which we usually would expect to be better than that of the obligor;
- the guarantor (if an insurer) must be internally rated at an equivalent of A- or better

Legal Risks associated with CRM

When taking advantage of CRM techniques the industry accepts that there are associated operational risks including legal risk. Failure to manage these risks effectively could lead to situations where legal certainty or enforceability may break down or the value of the mitigation may prove to be less than expected. Policies and procedures are in place to address these risks but there will always be some level of residual risk to human error or fraud. Any of the mentioned tools can be considered for CRM only if, following a review by our legal department, it is considered to be absolutely watertight and enforceable from a legal perspective. Under the regulations in some jurisdictions firms are required to provide the regulator, on an annual basis, confirmation from external legal advisors that there have not been any changes in law or regulations that could impact on the underlying netting agreements. In some cases firms said that CRM would not be recognised if the legal risk is deemed excessive.

The types of mitigants that are acceptable, the extent to which haircuts are applied and the arrangements for perfecting legal certainty and enforceability are set out in policies and procedures. There are also policies in place which govern the eligibility of financial collateral. The extent of haircuts applied is based on past experience, expectations of future movements and the level of credit risk appetite e.g. in normal circumstances policy may indicate a maximum loan to value of 80% but this may be moved to 85% when property prices are increasing and expected to continue to do so. Increasing use is being made of historical data to determine haircuts applied e.g. through the application of actual loss data by mitigant.

Depending on the type, CE and PFE may be reported taking into account the credit risk mitigation (e.g. collateral and netting) in a systematic way. Some techniques drive decisions on acceptable levels of exposure without being reflected against exposures in credit systems, e.g. purchased credit protection.

Example:

From a regulatory point of view:

• *With regard to the Large Exposure Regime there are five main types of credit risk mitigation used:*

a) pledging of cash collateral (pledge has to be equivalent to German Verpfändung)

b) use of close-out netting agreements for derivative business

c) credit derivatives (CDS in the trading book, CLN in trading and banking book)

d) pledging of securities (applying the regulatory haircuts)

• *Close-out netting is used wherever a regulatory acceptable netting agreement exists. The collateral referred to above is used on a case-by-case basis in order to ensure that we comply with the Large Exposure Upper Limits requirements*

Stress testing

Stress testing for managing concentration risk

The use of stress testing for the purpose of managing different risks is widespread throughout the industry. Stress tests are increasingly becoming embedded in firms' risk management culture and are often included as part of their internal risk reporting procedures. Firms' internal reports are likely to include the results of stress tests covering a variety of major risks such as market and credit risk, but increasingly they could also cover other risks such as concentration risk, operational risk, and reputational risk among others. Stress testing can therefore be seen as a tool for the purpose of managing a whole range of different risks, and the tests themselves are not always designed to capture a single specific risk. Running tests on macro economic scenarios will often result in reports covering a variety of increased sensitivities to a range of different risks, and not just to market or credit risks.

Stress tests for the specific purpose of managing concentration risk are therefore quite rare among participants in the questionnaire. Stress testing for concentration risk is not used universally among respondents, and when it is used it is rarely applied universally throughout the firm. Many firms use stress testing more selectively only under certain circumstances and often just on their riskiest portfolios. A few firms indicated that this was an evolving area within their organisations, with some institutions in the process of implementing new measures, suggesting that this was in part being driven by regulation. Many firms highlighted other important risk management tools used for the purposes of managing concentration risk including limit setting, large counterparty monitoring and reporting, and specifically the tracking of the financial performance of significant counterparties. One participant described the credit limit itself as a stress test since it represented the maximum loss to which they would be willing to be exposed to a counterparty or group.

Why use stress testing as a tool for managing concentration risk?

There were a number of reasons cited by those firms that do use stress testing to assess concentration risk and these included the following: -

- To identify the impact of concentrations not easily identifiable through standard exposure methods
- To identify single borrowers as well as sectors and regions with significant sensitivity to certain scenarios
- To determine how vulnerable counterparties are to external shocks
- To evaluate the scenario impact on risk capital and expected loss
- On demand and in response to recent relevant market events (e.g. oil prices increase, the Iran crisis, etc.)
- To see what events could cause a company to breach its loan covenants

- As part of the credit sanctioning process and to identify the drivers that could result in a counterparty being unable to service its obligations (for example where a counterparty is borrowing funds to take over another counterparty, stress tests will be used as part of the sanctioning process pro forma financials will be prepared that will be subject to a number of scenario testing including (i) changes in interest rates, (ii) a reduction in turn over and (iii) vulnerability to increases in raw material)
- To manage temporary exposures such as loan underwriting and bridge loans, designed to capture market stress risks during the commitment and syndication period while at the same time penalising large and longer term commitments

Single name risks

In general the firms that employ stress tests in the management of single name concentration risk do so through analysis of the bigger more significant names in their portfolios. A classic example of this is the firm that identifies the top 25 investment grade and non-investment grade exposures in each region according to a defined set of circumstances on a monthly basis. In a similar way another firm referred to the monitoring of their “jumbo” clients not only for the managing of risk, but also for marketing opportunities to extract maximum value from the relationships. This firm continually reviewed the limits set for these firms while performing simple ad hoc “what-if” tests. The circumstances include scenario factors ranging from foreign exchange rates, interest rates, equity prices, and credit spreads, with multi-factor scenarios also considered.

At another firm they describe a “single client approach” as an analysis of selected large clients under certain scenario assumptions with a view to identifying single borrowers as well as sectors and regions with significant sensitivity under certain circumstances. The tests are applied globally in order to evaluate the scenario impact on both risk capital and expected loss. The same firm also assesses the impact of these scenarios on correlations. A further example was provided by the firm whose credit analysts track the financial performance of the large names in its portfolio.

Although the CEBS questionnaire attempts to separate out the different risks subjected to stresses, it can be seen in many of the examples provided that firms simultaneously test on single name, sectoral and regional concentration risk. To illustrate this more clearly take the firm that measured the potential impact of a real estate crisis on its business. The effect of a resulting drop in asset prices and economic activity, combined with a simultaneous rise in interest rates were measured alongside potential troubles in the construction industry and related sectors (e.g. the cement and furniture sectors) and in households and the economy on the whole. Furthermore the firm assessed the potential losses in terms of collateral value held against corporate and household mortgages. In this analysis although concentration risk was identified as a specific risk factor, single names and/or exposure classes were not specifically tested.

Other concentration risks

Not all the firms specified events and situations for “Other concentration risks”. Consistent with the conclusions above many felt that the distinction between single name and “other” concentration risks was not necessary. Many firms commented that they did not distinguish between single and other concentration risks when deciding on the type of test as coverage and scenario definitions were flexible. However, for those that did specify scenarios under “other concentration risks” these included high oil prices (including shock of oil prices specifically on the mid-market portfolio), foreign exchange rates, the effect of a deterioration in the US auto sector on the large corporate book and other sector and economic

deterioration and downturns were considered. One firm undertook an assessment of individual business plans, whereby certain economic and political assumptions underpinning the plans are modelled to test the vulnerability of business plans to external shock. These included interest rate, inflation, and unemployment assumptions.

Country specific tests

Geographical concentration risk or country risk came up a lot in the responses provided by firms. One firm described their approach to testing for country risk, where on a weekly basis country portfolios are selected on a risk-based approach (e.g. Turkey, Russia), and certain portfolios are stressed against country-specific parameters, such as foreign exchange spreads, bond prices, and equity indices. Another firm outlined weekly monitoring of exposures to emerging market countries, with activity constrained through country limits. The firm controlled these exposures via several levels of limits reviewed at a senior management level.

Industry or sector specific stress tests

Industry or sector specific risks were also well covered in firms' responses. Firms risk reporting often includes reference to the key industry exposures, e.g. the top 20 industry exposures. The results are often compared to capital and wherever trigger levels are being approached or have been exceeded a reporting escalation process begins, often resulting in discussions at a senior level (e.g. with the Chief Credit Officer). Stress scenarios can be defined in terms of shocked default rates per industry sector to reflect increased default frequencies observed during economically stressed periods. For industry sectors, concentration risk can be calculated using "peak exposures" (PE) by aggregating the PEs of all counterparties assigned to the particular industry.

For one firm, stress testing formed a part of the sector concentration risk management framework, with a methodology designed to enable the Group to avoid losses due to concentrations of credit risk across sectors susceptible to similar stress events. This particular group's model considered ten to fifteen non-systemic stress scenarios analysed by the economics department to identify those sectors likely to be adversely affected by each scenario. The firm uses historical credit rating data to stress the portfolio of each negatively affected sector to produce a new profile under the stressed event. Potential increases in non-performing loans and the provision charge are estimated for each scenario based on the change in credit profile. The analysis is updated on a monthly basis and presented to senior management every six months, or more frequently if there is a significant change in the economic environment or scenario impact. A trigger limit as a percentage of group profits is set for the stressed provision charge. A stressed sector approaching the trigger prompts action to mitigate the relevant exposure(s).

If a firm becomes particularly concerned about a specific industry sector the portfolios covering that sector will often be subjected to additional stress tests. One firm used implied confidence levels extracted from default data in conjunction with internal ratings, to model expected and unexpected losses on relevant portfolios.

Trading book portfolios

Firms did not make a big thing about the differences in stress testing employed for traditional banking book type exposures and those used for trading book exposures. In general trading book analysis is done at the portfolio level, often using an Economic Capital model where one is available. The time horizon used and the frequency of the testing was often the only indication of a difference in

approach, with some firms' stress tests attempting to capture the characteristics and liquidity of a portfolio of tradable assets. However, the objective of measuring potential losses from the default of issuers or obligors remained the same. Revaluations are considered under certain constraints or economic scenarios and these are converted into constraints on the risk factors used in the model. The impact on counterparty ratings, expected loss and economic capital can then be derived via a number of portfolio simulations.

One firm's analysis of potential losses in the trading book considered the possible recoveries dependent on the seniority and product type. The same firm then defined the scenario in terms of shocked default rates per industry sector to reflect the increased default frequencies observed during economically stressed periods. As described above, a few firms described analysis on the different measures of future exposure employed in the models, including PFE, Current Exposure basis, and a commitment basis (or combinations of approaches), often on a range of underlying risk factors and for groupings of concentration risks.

Events and situations for which firms test

A wide range of events and situations were included in the responses we received. The specific scenarios will vary from firm to firm and according to the type of counterparty, the products they sell, the sector they are in, and where relevant, the reliance on a particular raw material (e.g. the price of oil). Some firms have specific teams (e.g. a "Scenario Analysis Team") which have the responsibility for identifying potential risks and scenarios for further analysis.

Scenarios are often chosen as a result of current developments in the markets, and are therefore not prescribed in firm policy documents. Market developments clearly drive the more ad-hoc stress tests that the industry describes. These are sometimes performed on request, requested either at a Group level or by a risk committee and are distinct from the regular tests performed that may consider for example a standardised recession event. Where macroeconomic recessions are considered, say on a group's portfolio, the analysis may well take into account how geographic and industry concentrations impact the results. Stress tests performed on demand include, oil price hikes, country specific crises (e.g. Iran crisis, North Korean missile launch etc), movements in credit spreads, shifts in foreign exchange rates, various relative movements in a counterparty's capital structure, and multiple default occurrences (such as auto sector ratings downgrades). Events are selected at some firms according to whether they could significantly affect the projected impairment charge attributable to individual business units.

"Some large exposures could, under adverse circumstances, affect the results of the Group as a whole (profitability not solvency). Accordingly, the group-wide annual stress tests, which analyse the risk to the firm's financial plans stemming from adverse business conditions, incorporate large-name or sector-wide defaults (additional details under "other concentration risks".)"

Finally, one firm described a scenario based approach, with analysis of a set of extreme assumptions at the outset about the default and loss behaviour of counterparties, following which they estimate what they could lose in such a stressed credit environment by simulating defaults in the portfolio and establishing a distribution of outcomes (the 90% confidence level was described as the amount they would lose under stress).

How often do you carry out stress tests and on what proportion of exposures?

Not all firms provided answers to this question. For some firms not currently using stress tests for managing concentration risk it was obviously not applicable.

In response to the question of how often the industry conducts concentration risk stress tests, as you might expect, all manner of answers were given. It was clear that some of the answers referred to stress testing conducted in general (not concentration risk specific), while others referred to their regulatory responsibilities. However, when it comes to limit setting for large exposure purposes the majority of firms monitored and reported these on a daily basis. This helps to explain the broad range of practice described, from daily testing, to weekly/monthly testing, to quarterly/annual testing, to tests only performed on an ad hoc basis and on request (perhaps only ever conducted once). The following are examples of some of the answers given:

- Adherence to product specific limits is managed on a daily basis
- Weekly stress tests done at a European legal entity level, based on stressed expected losses, with regular reporting to the relevant entity's credit committees.
- Weekly tests at a product level to determine the most sensitive single names. E.g. stress testing of mortgage and loan portfolios.
- Routine stress tests carried out by product level to determine most sensitive single names performed on a weekly basis. Other analysis performed on an ad-hoc basis as required.
- Scenario exposure reports run on a monthly basis highlighting the top 25 investment grade and non-investment grade exposures in each region based on a defined set of scenarios.
- Performed only on an ad hoc basis on the specific request of concerned parties at the firm, reflecting specific concerns about a sector or product.
- Quarterly tests at a group portfolio level.
- Simple stress tests were done throughout the year on request (e.g. Credit Directors).
- Annual stress tests, varying from tests conducted on the entirety of the large business loan books, to tests conducted as part of the counterparty credit review.

Test Results

The majority of firms that engage in some form of stress testing activity have in place a reporting process that requires some form of escalation to senior credit managers. This occurs when limits are breached, and the impact is considered material. Recommendations are often made, with limits reassessed and adjusted accordingly. In some cases the analysis is used to facilitate debate within senior committees regarding credit risk appetite and capital adequacy. In other cases the results are assessed as part of the credit sanctioning process, and therefore directly impact the firm's business decisions. In another example, a sector under stress approaching a trigger will prompt action to mitigate the exposure. At one firm considering its large business loan portfolios, the incremental effect of single name defaults on the impairment charge is included as an "add on" based on management judgement (either the Finance Director or the Head of Portfolio Management). These judgments are based on stress tests and historical experience.

Example:

"We possess a best-in-class system for assessing the current position in the credit cycle. This allows accurate forecasting of risk tendency, which represents the expected (average) loss across the loan book in the following year. However, this average can be overshoot because of various concentration effects. So expected loss "add-ons" are incorporated in the business plans, and these are informed by the various sector deterioration analyses that are conducted as well as historical experience"

Economic capital models

As described earlier in this report, economic capital models can be used to establish risk sensitive credit limits. Using economic capital based limits has the benefit of taking into account the size, default risk, loss-given-default expectations, and tenor, or term to maturity, of an exposure.

In practice how is this done? A firm calculates the amount of economic capital that is to be allocated to a particular business line. That line of business sets exposure limits based on a percentage of the total economic capital it has available (and in line with the sort of risk appetite policy and tolerance levels outlined above). A firm policy might therefore state that no more than 2% of its total economic capital could be made available to a single counterparty, or no more than 10% allocated to a single sector or industry. Under such a policy a large transaction with a high level of risk would consume a large percentage of the portfolio's available economic capital and therefore might exceed exposure limits. Whereas a small trade, with perhaps a better internal risk rating would eat up less of the available economic capital, and would fall within the firm's policy guidelines.

Economic capital can therefore provide a powerful measure of concentration. Portfolio managers using economic capital models can identify concentrations and set credit limits according to economic capital requirements (across product, sector and country lines). The allocations themselves are driven by the parameters of the model, and these are made up of the internal credit ratings for the individuals and counterparties in the portfolio. These ratings and what drives them then become the critical components of the limit at both the customer level and broad portfolio level. These will often then be reflected in the firm's lending policies and in summarizing portfolio credit quality in reports to senior managers and boards of directors. Such an approach using sophisticated credit risk models incorporating risk-adjusted capital methodologies can strengthen the risk management culture of a firm, primarily by reinforcing to the business lines the cost of capital based on the particular risks associated with their products and portfolios.

In a recent study conducted by JPMC to test the sensitivity of regulatory-versus-economic capital models to portfolio composition, a hypothetical portfolio was assembled that resembled a large bank's corporate portfolio. This £100 billion portfolio consisted of 3,000 borrowers with diverse exposure amounts, credit quality, maturities, industry, and country composition, as well as specific systematic correlation factors. Sensitivity tests were run to see the impact on portfolio capital defined at the 99.9 percentile. The results showed that when all the exposures were assumed to be in a single country or in a single industry, regulatory capital is unaffected but economic capital can increase markedly ("Economic versus regulatory Capital", a RMA journal, March 2006).

"The capital goals of supervisors and institutions are not necessarily identical (nor should they be) – but they are complementary." (Susan Schmidt Bies, Board of Governors of the Federal Reserve Board, December 2005)

CHAPTER FOUR

What do firms think of the current regulatory regime?

The provisions of the Directive are largely unchanged for large exposures since their original introduction. However, as evidenced by the work undertaken on the capital side, firms' risk management has changed significantly over that period of time. This has resulted in a divergence of practice between internal risk management and the regulatory requirements. Some firms went as far as to say that concentration risk management at a group level bears little, or no, relation to the large exposures regulatory regime, i.e. does not meet the use test. An illustration of the relationship between the industry's own approach to concentration risk and the existing reporting requirements for large exposures was provided through the organisation set up and divided responsibilities in place at some firms. For example, "Our Regulatory Reporting and Control department monitor the firm's exposures against the regulatory guidelines and report accordingly. At no stage does this require any involvement of our risk department, and there is no obvious overlap." This was echoed at another, saying that the "information produced for regulatory purposes is compiled in the regulatory area and is not used as an aid to risk management". One more firm said that their concentration risk measurement and management is captured by standard credit risk management policies and procedures, but that this was separate from reporting requirements contained in the current national regulatory regime. There were some exceptions cited, particularly by investment firms, who reported some overlap in responsibilities for inter company exposures, where the regulatory teams provided summary reports for risk management, but even these ended up being primarily used for large exposure regulatory requirements. Therefore, in general firms regard the current regime as either out of date or not aligned with their current risk management practice.

Some of the reasons that firms cited as to why they did not think that the single name regulatory framework was an effective tool were as follows:

- The regime is too blunt as it does not have regard to the nature or risk of the exposure. In particular it does not capture some of the risks that firms pick up internally but also picks up and constrains exposures that firms perceive to be much lower risk. Firms indicated that in almost all cases the internal limits were actually tighter than the regulatory limits and therefore the regulatory regime imposed a deadweight compliance cost.
- The rules are too prescriptive and not flexible enough
- The regime is not necessary because firms do not increase expected profits by increasing concentration risk, quite the contrary, firms manage concentration risk for the purposes of managing external expectations (ratings play a part), and liquidity (as well as solvency). Since firms incentives to manage concentration risk are stronger than those of the regulators there is no obvious prudential benefit
- Some of the exposure measures used for regulatory purposes are inconsistent with the way firms think of the risk internally
- Treatments for certain exposure types are inappropriate – for example intra-group
- Because the regime is quite old, there are an increasing number of areas where the regime is silent, i.e. has not been able to take account of developments. For example – structured products, changes to accounting treatments (such as consolidation), and credit risk mitigation.

This results in firms inevitably having to maintain two sets of systems both dealing with concentrations, and in the case of “limit setting” (see section on limit setting) perhaps resulting in two kinds of limit to a single customer group. More often than not, the internal measure will be based on a range of sophisticated risk management tools, including default grades, counterparty type and ratings, different methodologies for calculating exposures (e.g. “Expected Positive Exposures”), netting agreements, and industry, product, and geographical scale limits.

In terms of the constraints that firms identified in relation to the first bullet above, nearly all firms indicated that the current regime had impacted negatively on their business to some degree. The issues cited were as follows:

- Restricting business at an entity level, resulting in a need to book large transactions across a number of group entities or put in place capital maintenance agreements (an issue for large firms and sub-groups)
- Particular business exposures where large exposures has caused problems are – underwriting, syndicated lending and intra-group exposures
- Costs of maintaining regulatory system and management time associated with it, when it does not add to the risk management of concentration risk
- Conservative measures of exposure result in firms purchasing mitigants that they do not consider necessary, increased management time focussed on managing exposures that they do not consider require that level of management, missed business opportunities
- Certain designations of exposures in the EU restrict investment ability, such as to US agencies that do not benefit from an explicit state guarantee but are regarded as sovereign in the US (FNMA, FHMLC etc)
- In certain circumstances it has been necessary to obtain regulatory approval. This has resulted in delays in responding to customers and in some cases lost business.

Intra-group exposures

A further concern raised by participant firms relates to the interaction between rules for concentration risk and rules for liquidity risk. Intra-group exposures are subject to home country regulation whereas liquidity risk is subject to host country regulation. The typical 'parochial' view of each regulator thus creates an inherent conflict, with regulatory limits on cross-border intra-group exposures obstructing, either partially or in some cases totally, the free 2-way flow of liquidity within international banking groups. That has the perverse effect of adding to, rather than mitigating, systemic liquidity risk and is detrimental to consumers (depositors of such banks). Examples would be where a parent firm in one country is inhibited by intra-group regulatory limits from providing desirable liquidity support to its subsidiary firm in another country; or where a firm in one country is simply inhibited from lending to another member of its group in another country.

However, some respondents noted that the current regime was effective in that it addressed the key risks and created a crude backstop to limit excessive exposures (relative to their capital base). Such a regime had the benefit of simplicity, and thus could be relatively easily understood. However, even these firms have serious reservations about the current regime. For example while simplicity accorded with the treatment of some traditional banking products, it had not been able to take account of developments in the market. For example:

- there are a number of product areas where treatments are unclear or non-existent (in particular the treatment of options, regulatory treatments of derivative add-ons, credit derivatives, CDO structures),
- the regime is not risk sensitive and is unduly conservative in some areas (for example the recognition of risk mitigants)

- the regime may misrepresent the risk of some trading products and strategies.

There were also examples of where firms follow the national reporting requirements for Large Exposures (“closely linked”) for internal purposes. However where this was the case a firm would start with the limits required for external reporting purposes and consider their suitability for internal reporting purposes. Even in these few examples exceptions were detailed where alternative arrangements had been agreed with the regulator. For example in one case with respect to the limits set for certain off-balance sheet products (such as foreign exchange and interest rate products) the firm’s own more conservative methods of calculation are allowed. Additionally some banks had come to an agreement with their local regulator to use internal limits for the purposes of reporting (i.e. these firms use their credit system for regulatory purposes rather than their regulatory system for risk management purposes).

However firms predominantly do not use the regulatory information/system for the purposes of risk management. The exceptions noted by some firms concerned intra-group exposures (because of domestic regulatory restrictions, which suggest a higher level of risk than firms perceive) and use of regulatory information as a comparison for worst cases /outside limit on business. The reasons for not using the regulatory system were:

- Differences in exposure measurement between internal and regulatory systems (e.g. OTC derivatives)
- The fact that the regulatory system looked at worst case rather than more likely scenarios (this accords with the more general observation from firms responses that they are managing events less serious than a major threat to solvency)

Note that in terms of management sign off and escalation, some firms said that the process was consistent. Other firms made no comment.

International perspective

As the firms participating in this report are internationally active, most also cited concerns about the differences in the way that regulators have implemented the regime across the EU. In particular they noted the following differences:

- The use of exemptions is not consistent across jurisdictions – such as the treatment of intra-group exposures and use of conversion factors/weightings for certain types of exposure, and the use of solo reporting.
- Treatments/definitions of certain exposure types – for example exposures to exchanges and multilateral development banks
- Treatment of exposures within VaR models
- Treatment of exposure types not specifically covered in the Directive e.g. complex transactions, credit derivatives
- The extent to which different regulators implement in practice, for example in relation to the toleration of deviations – temporary excesses resulting from large transactions; use made by regulators of LE reporting; differing guidance given to different firms on the same issue within the same jurisdiction
- Sectoral limits imposed in some jurisdictions
- In addition one firm noted that differences in application are not restricted to Large Exposures.

Some also noted the lack of a global approach to concentration risk, as these firms operate in many more jurisdictions than those applying the CRD.

Such differences add to the cost of doing business as this requires management information to be adjusted to fit the needs of each regulator, thereby requiring separate processes to be set up, resulting in the inefficient use of scarce resource (including management time) and duplication of effort. Additionally some firms noted the costs in obtaining mitigants to reduce exposures to meet regulatory constraints, even where firms believe that the risk itself is minimal. These additional operational activities not only increase cost but also have the potential to increase operational risks. Firms also noted the competitive disadvantages they faced in attracting the same business in any given jurisdiction resulting from these differences.

Firms obviously found it difficult to determine whether the regime was effective from a prudential perspective. However, they questioned whether it assisted prudential assessment since it did not actually bite on most of their exposures and therefore merely added a compliance cost. They also highlighted that where it did impact it focussed mainly on those areas that firms regarded as low risk, it was unlikely to restrict exposure levels that are likely to seriously negatively impact a firm. They thought that the current regime may also give regulators a misinformed view of the levels of exposure, since it does not adequately take account of risk mitigants. It also did not provide regulators with any indication as to firms' ability to manage concentration risk, particularly as firms risk management systems have developed significantly over the years since this regime was introduced. The lack of consistency of application across Member States also means that a level playing field across the EU is therefore illusory. More widely some commented on the lack of a global approach to concentration risk. Although as indicated above, some thought that creating a simple backstop measure may have provided regulators with some comfort.

How should the regime develop?

One issue that the industry identified early on in its thinking is that any regulatory regime needs clear objectives, and that the objectives of the current regime were unclear. As a result we prepared a paper on objectives and principles that seeks to outline the objectives of prudential regulation generally and the objective of a large exposures regime specifically (see the Appendix). In developing any prudential regime, the industry considers that it is vital to set out the objective. In the case of large exposures the industry believes the objective to be:

"To provide an appropriate degree of protection against firm failure arising from concentration of risk in the credit portfolio."

The industry also believes that it is important to have a set of principles in order to determine the best policy options. The industry has identified these as follows:

1. Necessary: there should be no rules unless their absence poses a genuine and serious threat to the objectives.
2. Suitable: there must be a sufficiently close and credible link between the requirements and the objectives.
3. Proportionate: The rules should impose the smallest possible cost or burden consistent with its objectives and should be capable of being applied by everyone without incurring disproportionate cost.
4. Clear and transparent: requirements should be clear and transparently applied.
5. Appropriate with regards to the international competitive position of the EU financial services industry.

The industry considers that the development of any future regime should be done within a framework such as this to ensure the best outcome for both regulators

and the regulated. The industry group is also looking to develop answers to a set of questions that it has identified as being the building block issues for developing a regime, with a view to developing policy options. This work is still in progress, but members would be happy to make this available when it is complete.

That said, responses received from firms did outline their views on a number of related issues:

- i) The need for a large exposures regime
 - A number of firms considered that a regulatory limits regime was no longer necessary because concentration risk was already covered in Pillar 2.
 - A few indicated that a regulatory backstop limit might be appropriate but that there should be a more qualitative assessment of a firm's own concentration risk management, flexibility to accommodate developments, a global perspective should be considered not just focusing on the EU.
 - One firm indicated that the existing regulatory environment was satisfactory but would need updating in certain areas to reflect developments in business practices.
- ii) Regulatory concerns relating to smaller and larger firms:

One firm indicated that there are two concerns that might concern regulators – micro prudential, i.e. the risk that excessive exposure might threaten a particular firm and macro prudential, i.e. that the entire system is over exposed to something. This firm considered that larger firms benefit from natural diversification and therefore are unlikely to acquire single name exposures that will threaten solvency, but this is not the case for smaller firms. Limits applied to small firms provide no prudential benefit when applied to large firms. One other firm specifically addressed the issue of firm size. This firm also agreed that a one size fits all solution would not be appropriate
- iii) Risk management capability:

Most firms indicated that risk management capability and sophistication should be taken account of in the assessment of concentration risk.
- iv) Portfolio concentrations

None of the firms thought that there should be a limits regime for portfolio concentration risks – sectoral and/or geographic. The reasons cited were as follows (starting with the most common answer):

 - The risks will be different between firms depending on business profile; one size would not fit all.
 - The risk is already managed and different firms will have different views on correlations and concentrations. Therefore such a regime would not build on risk management practice
 - Cost likely to be high compared to any regulatory benefit (correlations are not fixed, boundaries would be arbitrary – therefore a limit regime would either fail to capture concentrations and/or bite unnecessarily, while incurring a significant systems cost to firms)
 - Limits regime is unlikely to be flexible enough to address changing economic conditions
 - Create a competitive disadvantage for EU firms
 - Potential for undesirable consequences – such as effectively imposing credit controls on certain industries

APPENDIX

CONCENTRATION RISK: OBJECTIVES AND PRINCIPLES

Objectives of EU banking directives

- | |
|---|
| <ol style="list-style-type: none">1. Protecting consumers.2. Promoting financial stability/confidence in the financial system.3. Deepening the Single Market in financial services.4. Promoting efficient allocation of resources and risks within the EU. |
|---|

The first two objectives are *prudential objectives*, which exist regardless of the extent of cross-border trade in services. Prudential regulation is justified by market failure. The biggest failure in financial services is risk externalities: firms shift some of the risk to others (notably to consumers and to other financial firms) while retaining all the benefits. The purpose of prudential regulation is, as far as possible, to reproduce the outcomes of a market not subject to these failures, by forcing firms to internalise the externalities.

The regulatory objectives boil down to providing an appropriate but finite degree of protection against loss caused by insolvency to:

- *consumers* and
- *the financial system* (i.e., other financial institutions).

The third objective is a *competition* objective, which locates the financial services directives within the rubric of single market legislation. Article 2 EC Treaty contains an instruction to establish an internal market. (The rationale is that economic and financial integration increase both the level and the rate of growth of EU GDP.) Article 3(c) sets out, as an ‘activity’, an ‘internal market’ characterised by the abolition of obstacles to the free movement of goods, persons, services and capital. The financial services directives are concerned with the freedom to provide services and the right of establishment, and they create these rights by granting a passport.

The objective of deepening the single market in financial services does not by itself justify setting EU-wide standards, but there are externalities to the exercise of the Treaty freedoms. Financial firms are regulated. The EU passport operates by mutual recognition and home state regulation. Since prudential regulation affects competitive conditions, there is a tendency for uncoordinated financial regulation to race to the bottom, producing standards that deliver a lower degree of consumer protection and financial stability than is optimal. The standards set out in the directive therefore fall within Article 3(h): the approximation of laws to the extent required for the functioning of the common market. Without this cross-border externality, EU-wide standards would not be justified, according to the subsidiarity principle. Most of the text of the directives is concerned with standards; in practice, therefore, it is the *prudential* objectives that dominate the design of EU standards.

The fourth objective requires policymakers to recognise that financial services fulfil a necessary social function with enormous implications for income and growth. Banks and capital markets intermediate between borrowers and investors and determine which entrepreneurial projects receive funding and which do not. Banks also clearly

provide liquidity insurance: they borrow short and lend long, so that customers can absorb shocks to their cash flows. Capital markets perform a similar function, transforming securities of a given contractual maturity into assets of much lower effective maturity. So *intermediation* and *liquidity insurance* are the main consumer benefits of the markets being regulated. Interference with these functions is costly.

NB: None of these objectives is logically prior to any other, and they can conflict. It would make no sense, for example, to promote integration at the cost of excessive financial instability; and it would be absurd to promote financial stability simply by banning financial intermediation. Each objective represents a benefit; and these benefits must be balanced (so, for example, a zero-failure regime is suboptimal).

Objective of EU norms relating to concentration risk

To provide an appropriate degree of protection against firm failure arising from concentration of risk in the credit portfolio.

Neither for internal risk management nor for regulatory purposes does there exist a single, simple and reliable way of measuring all the diverse risks undertaken by financial firms. Risks are therefore decomposed and measured separately. Credit risk is usually considered the most important risk run by banks and it is an important risk for investment firms. Regulators believe that concentrations in the credit portfolio have contributed to a number of instances of banking failure or distress. The Basel Committee (*Bank Failures in Mature Economies*, 2004) concluded that concentrations had played a role in at least seven of the thirteen episodes studied (although it never defined the term).

So the objective of a concentration risk regime is to provide an appropriate degree of protection against the risk of firm failure arising from concentration of risk in the credit portfolio.

Regulatory principles

Once objectives have been set, principles are needed to distinguish between better and worse policies. The industry group has identified the following principles:

A Large Exposures regime must be:

1. **Necessary:** there should be no rules unless their absence poses a genuine and serious threat to the objectives.
2. **Suitable:** there must be a sufficiently close and credible link between the requirements and the objectives.
3. **Proportionate:** The rules should impose the smallest possible cost or burden consistent with its objectives and should be capable of being applied by everyone without incurring disproportionate cost.
4. **Clear and transparent:** requirements should be clear and transparently applied.
5. Appropriate with regard to the international **competitive position of the EU** financial services industry.

1. Any regulation must be **necessary:** there should be no rule unless the absence of any rules poses a genuine and serious threat to the objectives.

The burden should be on the Community institutions to demonstrate that intervention is necessary to achieve policymakers' expressed, legitimate objectives (and not other, unspecified objectives).

Once objectives have been set, it is important to consider what would happen if there were no regime at all - because this is the option imposing the lowest possible burden. In assessing this 'no action' scenario, policymakers need to take into account other regulations, laws and institutions constraining risk-taking by firms: e.g., other regulatory provisions in existence that may influence behaviour, corporate governance laws and codes, statutory financial reporting, rating agencies, and market discipline. If the 'no action' outcome produces no genuine and serious threat to the specified objectives, there is no justification for regulation.

2. The regime must be **suitable:** there must be a sufficiently close and credible link between the requirements and the objectives.

It is important to explain how the rule is designed to achieve the objective'. Those subject to obligations are entitled to understand *how* the rule is expected to mitigate the risk of concern and to challenge implausible explanations.

3. The regime must be **proportionate:**

The regime must not go beyond what is necessary to achieve its objectives: Article 5 EC Treaty. Proportionality is simple to define but rich in its consequences, which include the following.

A closely related principle is that similar firms should be treated similarly and different firms differently in proportion to their relevant differences. (A regime that fails to recognise relevant differences is likely to impose unnecessary burdens on some firms.) This principle is (a) a definition of fairness (b) a condition for efficiency and (c) a definition of the level playing field. The important question is *relevant* similarity and difference. Nationality is not a relevant characteristic: Article

12 EC Treaty. Relevance must be determined by reference to the legislative objectives. The characteristic most relevant to the prudential objectives is the size of the externality (which is a combination of risk and impact).

A more precise definition of the ‘level playing field’ follows from this principle. Competitive equality is achieved when firms can compete freely, once those characteristics relevant to the objectives are corrected for (i.e. when externalities are internalised). When firms posing greater risks to the objectives of policymakers are subject to the same burdens as less risky firms, competition is not equal because the former set of firms is permitted to take risks for free.

Proportionality implies ‘risk-sensitivity’, but not vice versa. Where the risk to regulatory objectives *posed* by a firm is reliably related to the risk *borne* by a firm, and where the latter risk can be measured, proportionality suggests that the burden on firms should be proportionate to that measured risk: that is, that the regime should be risk-sensitive. But ‘risk-sensitivity’ has no sense of proportion: it presupposes that the smallest risk requires a regulatory response, regardless of the size or cost of that response.

Policymakers need to consider *all* available types of intervention (e.g. Pillars 1, 2, 3, hard limits, alternatives to regulation) *before* choosing a particular type or types. Otherwise they risk imposing greater than necessary burdens.

Where risks measured by firms are reliably related to risks to regulatory objectives, regulators are likely to minimise compliance costs by using firms’ risk measures. This may mean using firms’ measures as inputs but with regulatory capital requirements/limits (as with internal models); or, alternatively, using firms’ measures *and* firms’ limits, with supervision of related systems and controls (a Pillar 2 approach). Even where basing rules on management information is not incentive-compatible, there are some advantages to both sides in using management information: the regulatory data are far more likely to be accurate, complete and timely; the duplication of costs is minimised; and management are more likely to understand how the numbers relate to their business.

Additionally the cost of compliance should not have a significant distributional impact - in particular, on small firms - unless justified by relevant differences between firms. The best way to satisfy this principle is to keep the rules simple, or to offer a simple approach as one of a menu of options.

4. The rules should be **clear** and their application should be **transparent**.

Clarity and transparency are needed for at least two reasons: to allow the regulated to understand their obligations, predict their application and regulate their behaviour accordingly; and to assist international comparison (and, if necessary, enforcement). It is the regime in action, not in the rulebook, that is relevant, and so significant exercises of regulatory discretion should also be public.

5. Policymakers should have regard to the international competitive position of the EU financial services industry.

Non-EEA firms provide financial services to consumers in the EEA in large volumes. A regime that renders EEA firms unable to compete with non-EEA firms reduces the degree to which the social benefits of financial services accrue in the EEA, while achieving little or no prudential benefit.