CEBS QUESTIONNAIRE ON CONCENTRATION RISK

General approach to concentration risk

1. In general terms do you, for internal purposes, adopt an approach to concentration risk measurement and management which is closely linked to the limits and reporting requirements contained in the current national regulatory regime. If so, please describe your approach. Note if your answer to this question is positive, many of the questions set out below may not be relevant to your circumstances.

For internal purposes, we measure and manage concentration risk with an approach based both on regulatory regime and on internal methodology and processes.

In particular, Large Exposure rules are used

- to control concentration ex post and produce the regulatory report,
- for *ex ante* assessment in the credit approval process, particularly for loans submitted to Credit Committee, Executive Committee or Board of Directors.

As for internal methodology and processes, they are described in the following answers.

Nature of concentration risk

2. What is your understanding of the nature of concentration risk?

In answering this question you might address

- how you define the risk of loss resulting from concentration of risk in the credit portfolio
- What is it you are managing when you consider significant single name exposures and concentrations in your credit portfolio?
- what, for internal risk measurement and management purposes do you consider to be the risks associated with:
 - (a) single name concentration risk;
 - (b) other concentration risk (for example sectoral or geographic)

For example, do you consider such risks as being related to ensuring that portfolio credit risk capital calculations are not undermined by incorrect correlation or diversification assumptions? Do you consider such risks to be related to 'tail event' losses – i.e. to protect against losses in the distribution beyond a chosen confidence interval? Do you consider them to be related to aspects of model risk or the real world simply not fitting the modelled world? Do you consider them to be related to time horizon aspects – e.g. large unexpected losses occurring over a short timescale rather than over the normally considered horizon e.g. 1 year? Etc.)

We would be grateful if respondents could in their responses distinguish as clearly as possible between single-name and other concentration

Concentration risk may be defined as the risk of incurring in a huge loss due to

- default of a single "large" exposure (single name concentration risk)
- simultaneous default of a set of exposures because of a shared common risk factor (other concentration risks).

Concentration in this approach is a concept opposite to diversification,

• diversification leads to bear only non diversifiable risk, i.e. a perfect granular portfolio with very small individual contribution to the total risk, linked to a variety of different risk factors,

• concentration is the situation in which one depends only from one investment, i.e. is exposed to a specific risk profile with rare but highly critical events.

The level of diversification (something in the middle) is usually measured like the distance from perfect diversification, which is quite an abstract concept. Only in the case of perfect single name concentration it is straightforward to identify concentration risk as the difference in risk measure between the actual portfolio and an infinitely granular one.

In the case mentioned like "other concentration risks" internal models take into account risk arising from different type of risks (due to a set of underlying risk factors) applying simulations or sensitivity analysis. The concentration effects arise from the portfolio exposition to definite risk factors and depend on the risk profile of the shocks applied to the portfolio distribution (is "scenario specific" or "conditional" to some event types).

Correlations' estimate is consequently crucial in order to properly measure all kinds of concentration risks apart from single name. Some caution is needed in interpreting these results because correlations are usually estimated through proxies variables, and sectors or areas are aggregated according to rather arbitrary criteria, so that results are subject to what can be defined model risk or model dependencies. Even if correctly estimated, correlations can be subject to structural breaks as a consequence of stress situations on the economic context, thus originating losses potentially higher than the ex-ante estimated "concentration risk". In our approach this situation is managed through "stress test" analysis, taking into consideration also correlation stressing.

Time horizon effects and different speed of the shocks have not yet been fully explored. Consistently with the probabilities of default horizon and the financial report frequency, the time horizon for credit risk in our approach is fixed to one year. Capital at risk is therefore adjusted to offer a risk picture set to this time horizon in term of rating migration and scenario impacts.

Counterparties and relationships between counterparties for single-name concentration risk:

3. For your internal risk measurement and/or management purposes, how do you define 'connectedness' of counterparties? What factors do you consider determine 'connectedness'? To what extent and how, for your internal risk measurement and/or management purposes, do you take account of relationships / connections between counterparties (e.g. parent and subsidiary)?

In the internal credit policy, groups are defined as companies <u>legally</u> connected (legal group, defined on the basis of control definition of regulation instructions and Italian law) as well as companies <u>economically</u> connected (when among counterparties there are such links that if one of them faces financial troubles, the others are very likely to face difficulties in debt repayment) even though relevant link are not explicit.

Legally connected companies are taken into consideration at two levels:

- The first in setting PD for the different entity of the group because of central management and potential cash flow cross subsidization across the group,
- The second considering the group like a single entity in the credit risk portfolio, increasing the single name concentration effect.

In the case of <u>economically</u> connected companies concentration arise because of portfolio model correlations.

4. For your internal risk measurement and/or management purposes how do you approach the issue of exposures to entities or products consisting of underlying assets or items (e.g. exposures to special purpose entities, collective investment units)? In what circumstances if any do you adopt a 'look through' approach? How do you calculate your risks in this context?

SPE are treated like single name entities; support by sponsors and promoters are assessed along the rating assessment process (PD impact) and along the security package assessment process (LGD/EAD impact). In particular, in assessing specialised lending operations - such as project finance, real estate developers, etc. – we consider an entity or a project on a standalone basis only if it is at an arm length from its parent or sponsor company, i.e. if any financial trouble of the entity/project does not propagate to parent/sponsor.

Assessment on a standalone basis usually implies

- a more conservative expected loss because of lower rating assessment,
- a lower risk capital, because of the lower concentration risk.

A "look through" approach is applied for structured product (i.e. basket of single name transactions, CDOs, CLOs, corporate names securitisation, and so forth) but, at the moment, in our portfolio, these exposure are negligible and the concentration effect is minimal.

Measurement of exposures:

5. For internal measurement purposes, how do you define the amount at risk? In particular please outline your approach to loans, undrawn facilities, guarantees and similar obligations, derivative exposures (with future volatility), structured transactions, intra day and settlement exposures.

For products where future exposure may fluctuate please outline your approach to this aspect (e.g. use a confidence interval, worst case scenario, other – please specify). If there are any other factors that influence the measurement of risk, please specify.

While for Large Exposures regulatory report we obviously follow regulatory rules, in internal models we transform undrawn lines and other off-balance sheet exposures into cash equivalent exposures through a system of internally estimated Credit Conversion Factors. Credit Risk Equivalent of derivatives is calculated according to a Current Exposure Method, aligned with the 1996 Basle Accord Amendment. We are currently migrating to the new standardised approach for counterparty credit risk, as of the July 2005 amendment to the New Basle Accord (Basle II).

- 6. For your internal risk measurement and/or management purposes, How do measure:
 - (a) single name concentration risk?;
 - (b) other concentration risk? sectoral, geographic, etc.

In answering this question we would be grateful if you would provide a detailed explanation of the conceptual basis of your approach in this regard – VaR, expected shortfall, etc? Please provide actual and concrete examples.

In order to understand how concentration risk is taken into account into the credit risk economic capital model, it is worthwhile summarising how the model works:

- Exposures in the portfolio are pooled into clusters according to counterparts economic / geographic sector, size and rating.
- > The model is based on the Merton's assumption that a firm defaults when the value of its assets decreases under the debt value. The relevant correlation is then asset value correlation, which is modelled through two components:

- Correlation among economic sectors (intra sector correlations);
- Specific correlation, that is the correlation of each counterpart to its economic sector (infra sector correlations); correlations are higher for larger (in terms of turnover) firms.
- Changes in risk factors, simulated through a Montecarlo method, involve changes in clusters' PD. Each obligor in the cluster is assumed to default or not according to a Bernoulli distribution with the success probability set at the PD level (default mode approach).
- Credit risk economic capital is the 99.95th percentile of the joint distribution of losses on the different exposures net of expected loss.

The framework used is thus a Earning at Risk one (i.e. the capital is set at a cut off point expressed in as a definite percentile); correlations among exposures classes are used to connect clusters' default intensity to risk factors shocks. Concentration (and diversification) effects thus result implicitly from the aggregation, while the breakdown of the individual risk types (except for concentration risk) cannot be explicitly calculated.

Single name concentration is considered in simulating the default / no default event. The number of defaults occurring for each cluster is simulated (from a Bernoulli distribution) on the basis of a parameter that is computed using a "diversity score" approach to take into account infra-clusters concentration: the total number of exposures in the cluster is set at the reciprocal of the Hirschmann-Herfindall concentration index¹, which takes into account the actual exposure of the bank towards the various counterparts.

In this case, perfect diversification corresponds to the infinite granularity hypothesis: in the model framework, this can be obtained by simulating the Expected Loss distribution instead of the Actual Loss distribution, i.e. avoiding to simulate, for each cluster, the actual (not the theoretical) number of defaults².

As far as sectoral and geographic concentration is concerned, the diversification benefit is implicitly taken into account through the correlation matrix among economic sectors, which are also geographically differentiated (Italy, Europe, US and World).

Some experiments of explicitly measuring concentration has been done by defining benchmark "diversified" portfolios, according to different criteria (equal exposure for each sector, sectoral distribution of exposures corresponding to the European banking system distribution of exposures, etc.). These simulations did not material risks due to geographical or sectoral concentration.

7. Are these approaches closely integrated into your internal business decision-making? please give examples. For how long have you adopted this approach?

We would be grateful if respondents could in their responses distinguish as clearly as possible between single-name and other concentration risk aspects.

Current credit risk management system is in place since 1999. During last years, it has been revised for specific aspects and extended in scope, but the overall framework is substantially unchanged.

As detailed in answer 9, Expected Loss and Risk Capital are used in a wide range of activities, such as loan approval and control process, pricing at origination, business units' risk adjusted performance measurement, limit setting for financial institution and country risk exposures, collective assessment of financial assets, and so on.

.

¹ H = $(\sum EAD^2)$ / $(\sum EAD)^2$, so that its reciprocal can be thought of as the "actual" number of exposures.

² The same result can be obtained by replacing 1/H with an arbitrarily large number.

8. In relation to securities financing transactions (repurchase agreements, securities/commodities lending/borrowing agreements, margin lending), what approach do you take to the measurement of single-name exposures? Do you make use of an 'expected positive exposure' methodology? Please describe in detail the approach adopted and the conceptual basis.

Collateralised loans, margins lending and securities agreements are already considered in our concentration measures because the facility is applied to the total counterparty's exposure and collateral is only reducing LGD measures. Repo style transactions until now are treated like counterparty's exposure only for a small amount, being directly guarantied by underlying securities available; we are moving to a "look through" approach to take into consideration issuers behind securities to be repurchased.

As said before we are using a CEM approach to the counterparty credit risk. We are moving to the new Standardised Approach and, only for a small part of the portfolio we will likely apply the new internal model approach, i.e. EPE measures.

Monitoring and management of risk:

9. What is your approach to the management of single name concentration risk and other concentration risk (e.g. sectoral, geographic, etc.) Please provide a comprehensive and detailed descriptions and explanations.

We would be grateful if you would provide a detailed explanation of the approach(es) you use to manage single name concentration risk? You might address:

- A full explanation of the conceptual basis for the approach that you operate.
- Whether, and to what extent, the type of counterparty is a material factor in determining your approach to managing and mitigating the risk? For example corporates, credit institutions and investment firms, other financial, government, SPEs/structured transactions.
- To what extent, if any, is the creditworthiness of the counterparty an important factor in the management of concentration risk. How is this aspect taken into account?
- Whether you use an approach based on limits? If so, what are those limits? Do you set absolute limits (e.g. €50m) or limits relative to something else (e.g. 10% of capital)? If you use relative limits, what do you measure against? What factors do you take account of in setting limits (e.g. product type, banking book/trading book, tenor, rating, type of counterparty, creditworthiness of the counterparty)? Do you set limits by counterparty or product? To what extent, if any, are portfolio effects recognised?
- Whether you adopt an approach based on capital allocation in your management of risk. If so, please provide a detailed description/explanation?
- Other than limits and/ or capital allocation, do you use any other risk management methodologies to manage single name exposure? If so, please tell us what you do and why.

We would be grateful if you would provide a detailed explanation of the approach(es) you use to manage other concentration risk (sectoral, geographic, etc). You might address:

- A full explanation of the conceptual basis for the approach that you operate.
- Indication of other types of concentrations of credit risk you consider in your risk management (e.g., sector, country, collateral issuer concerning the latter see question 13 below).
- How do you manage those concentrations (e.g. limits, capital allocation, or more informal monitoring etc).
- If you use limits, what factors you take into consideration in how they are set (e.g. credit rating of the government in setting country limits)?
- How you determine geographic, sectoral and/or other 'clustering' limits?
- Whether you use any risk mitigants against the concentrations identified above? If so, what are they? How do you take account of them?

Single name concentration risk

Monitoring and management of single name concentration are based on Large Exposures regulatory rules and on credit risk management methodologies described in answer 6.

Regulatory rules and internal models form a consistent framework for all types of counterparties. However, management system is different for corporate exposures, where explicit limits exist only in regulatory approach, and for financial institutions and country risk exposures, where an explicit limit setting is in place.

Creditworthiness of counterparties (rating) is the primary factor of every credit management decision. Corporate which potentially generate concentration risk are analysed by Credit Committee on a case by case basis, supported by a marginal economic capital impact simulation and pricing analysis, even though no explicit limit system is in place (except obviously for regulatory rules). Moreover, the levels of authority of Credit Committee are structured according to internal rating.

For banks and financial institutions, limits are set according to rating as well as transaction characteristics.

The Bank has in place a capital allocation system to feed risk adjusted performance measures. Expected Loss is used in place of provisions to charge credit cost on P&L accounts and Risk Capital is allocated to Business Units to obtain measures of (RA)RORAC, which contribute also to the incentive schemes. Such performance measures are available at each single customer's level. Since concentration risk increases capital and depresses risk adjusted profitability, capital allocation is an indirect system of concentration risk management.

Other concentration risk

As described in answer 6, risk capital takes into account risks arising from concentration on specific sectors and geographical areas, as well as single names.

Explicit limits system is in place for country risk exposures, where limits depend on risk capital, thus taking explicitly account both creditworthiness and concentration risk.

For others sources of concentration risk, there is not a structured limit system: concentration risks are addressed by top management on a case by case basis.

Moreover, reward system today in place provided by capital allocation system incentives to avoid main type of concentration risk, in the same mechanism described above to manage single name concentration risk.

Stress testing

10. Do you adopt an approach to managing concentration risk based on stress-testing? If so please provide a detailed description/explanation.

In your response you might include the events / situations for which you test; the conceptual basis for your approach in this regard; how often you carry out stress tests; and on what proportion of your exposures.

We would be grateful if respondents could in their responses distinguish as clearly as possible between single-name and other concentration risk aspects.

We have not yet adopted a regular stress testing program. Stress tests are performed whenever events or situations occur which may result in significant losses for the Bank.

As an example, we tested in the past the potential impact of the default of a large customer, located in a region of high presence of the Bank. Besides losses incurred directly from the exposure toward the customer, we measured the potential contagion effect on suppliers,

households (through unemployment), and the local economy as a whole. Such exercise can be considered a stress test simultaneously on single name, sectoral and regional concentration risk. More recently, we measured the potential impact of a real estate crisis, resulting in a dramatic drop in asset prices and economic activity, combined with a simultaneous rise in interest rates. The effects were measured in term of potential troubles in construction and correlated industries (e.g. cement, furniture, etc), in households and economy as a whole, and in term of collateral value loss for corporate and households mortgages. In this case, concentration risk was referred to a particular risk factor (or a set of risk factors) rather than to particular names or exposure classes.

Single entity vs. Group level

11. Do you set limits and/or apply your concentration risk measurement and management policies at a group level, subgroup level, and/or at individual entity level? Please provide details and explanation.

Risk measurement and management policies are defined by the relevant functions of the Parent Bank and are in force at the Group level.

As a general principle, risk coming from each transaction is measured as contribution to the Group risk. Consequently, risk measures are independent on the organisational structure of the Group. The Parent Bank also performs general functions of risk management and control and makes risk-acceptance decisions in the case of major risks. The Group companies that generate credit risks are assigned limits of operational autonomy and each has its own control structure. For the main Group banking networks, these functions are carried out, on the basis of an outsourcing contract, by the Parent Bank's risk control functions, which periodically report to the Board of Directors and the Audit Committee of the subsidiary.

12. In relation to intra-group exposures please describe in detail the approach that you adopt. How do you set limits, allocate economic capital, etc in respect of such exposures? How do you approach the question of cross-border intra-group exposures?

Intra-group exposures involving material credit risk are assessed and approved at the Group level; marginal capital impact is also assessed (ex ante) and measured (ex post) at Group level.

The need to set limit and to manage infra group transactions arise in the following cases:

- when a Group subsidiary take on an exposure too large for its individual regulatory rule, the Parent Bank issues a guarantee to take on part of this risk;
- when the subsidiary originating the exposure or taking the book is different from the one managing the risk, then both companies enter an internal deal to transfer risk.

However, since for risk management purposes the Group is managed as a single entity, we do not use limit setting for intra-group exposures nor include them in capital allocation process.

Please provide as detailed as possible an explanation of the conceptual basis for your approaches in the above regards.

Credit risk mitigation

13.Do you use credit risk mitigation techniques as part of your approach to reduce single-name concentration risk? If so, please describe the methods that you use (e.g. collateral, guarantees,

netting etc) and the circumstances in which you would adopt a particular approach and why you use that approach.

In relation to funded credit protection you might address:

- What types of collateral you use to reduce large exposure calculations for your internal purposes. Does this include collateral not recognised for regulatory capital purposes please describe and explain your reasons.
- How you calculate the value, exposure, or loss-reduction to be attributed to funded protection applied to large exposures? How you haircut the value of the collateral? How you take account of the frequency of remargining?
- How do you take account of correlation between collateral asset values and events (systemic, idiosyncratic) giving rise to or arising from the default of the counterparty (e.g. the need to realise a large amount of collateral in a short space of time).
- Whether you use a 'top-slicing' approach i.e. using credit protection to reduce the uncovered part of the exposure to a particular level e.g. the internal limit?
- Where you use netting agreements, the basis on which you calculate the net exposure? Please explain any differences between the regulatory and risk management netting sets (e.g. onbalance-sheet, off-balance-sheet, banking book/trading book etc).

In relation to unfunded credit protection you might address:

- What forms of unfunded protection you recognise as reducing credit risk (e.g. guarantees, credit derivatives). In what circumstances do you use these approaches?
- How do you take account of unfunded protection (e.g. substitution, adjustment of loss estimates, etc)
- How do you take account of correlation between the credit quality of the protection provider and events (systemic, idiosyncratic) giving rise to or arising from the default of the counterparty (e.g. the need to realise a large amount of collateral in a short space of time
- What policies do you have on who you will recognise as a credit protection provider (e.g. guarantor)?
- In relation to both forms of credit protection do you take account of any legal risk associated with credit risk mitigants? If so, how?

Concentration risk is already a part of Credit Risk, measured in the same unit (economic capital absorption). Mitigation policies for are the same as credit risk in general, i.e.:

- Collateral and guaranties reduce concentration risk because they reduce the amount at risk;
- Third parties' guarantees (credit derivatives are part of them) on the single counterparty are reducing concentration because somebody else is sharing the counterparty credit risk.

Strong mitigating factors are financial collateral and residential mortgages. Other mitigating factors are non residential mortgages and pledges on marketable assets. Also facility type, in particular self-liquidating finance, can be a source of risk mitigation.

Mitigating factors not eligible for regulatory purpose can sometimes be accepted (e.g. non marketable collateral or negative pledge) but are assessed on a case by case basis. No mitigating value is assigned to collateral whose value is correlated to obligor's credit quality.

Mitigating effect of guarantees and credit derivatives is assessed on the basis of PD substitution, taking into consideration a conservative assessment of double default effects.

Security package is generally defined in the contest of loan structuring and it is designed to optimise the risk-profitability relationship. Only seldom collateral or guarantees can be explicitly requested to satisfy regulatory Large Exposures limits. However, in order to reduce exposures without noticing it to the customer, we use sometimes credit derivatives or risk reduction through cash collateralised silent participation of other banks.

'Indirect Concentration Risk'

14.For your internal risk measurement and management purposes how do you deal with the issue of 'indirect concentration risk' – that is single name or other concentration risk arising in respect of indirect exposures to the issuers of collateral or the providers of unfunded credit protection?

See also answer to point 8. At the moment financial collateral are considered like guarantees, not direct exposure to the underlying issuers. For Repo style transactions we are moving to a "look through" approach to have a measure of potential concentration in the event of substitution risk. The actual assessment is that this revision will not highlight particularly high concentration because of indirect risk.

As for unfunded credit protection, guarantors are subject to the same credit approval and management process as direct exposures. In particular, for banks, which are the most important credit protection providers, both direct and indirect risks are included in the limit system mentioned above and taken into consideration for concentration purposes.

Governance and reporting

15.Please describe your internal governance and reporting policies and procedures relating to single-name and other concentration risk.

In relation to this aspect you might address:

- Your governance structure for setting, amending, and dealing with breaches of limits? Are limits hard or soft?
- What factors influence monitoring frequency?
- What information and reports are provided to senior management and how often? Why did you select that information as having significance? What elements of risk is senior management monitoring?
- Any other aspects of your concentration risk governance structure not covered above.

Regulatory limits are monitored ex ante in the approval process. In no case breaching these limit can be authorised. The situation of Large Exposures is reported quarterly to the Audit Committee and the Board of Directors. Such reporting includes also an overall portfolio credit risk analysis, in which economic capital (and thus concentration risk) is embedded.

Banks, financial institutions and country risk limits are monitored daily and their situation is reported monthly to the Financial and Market Risk Committee and to the Executive Committee. Ad hoc stress test analysis as described in answer 10 are reported either to the Audit Committee or the Financial and Market Risk Committee according to the nature of risks considered.

Regulatory Environment

16.Please set out your experience of, and views concerning, the current large exposures regulatory regime.

In your response, you might address:

- Whether you consider the large exposures regime effective in addressing the key risks inherent in large exposures/concentration risk? Please give reasons for your view. How do you view the trade-off between the costs of the current framework and its benefits in terms of, for example, prudential soundness, simplicity, cross-border harmonisation, competitive fairness, etc.

- Whether you feel that the current limits are satisfactory, both from a prudential and from a level playing field perspective?
- Whether you feel that the current limits are adequate for all institutions and that there should be the level of the limits should be commensurate with the risk profile of the institution
- Whether you feel that the large exposures regulatory regime should capture (and limit) concentration risks (sectoral, geographic). Please explain the rationale.
- The extent, if any, to which the current regulatory regime constrains actions that you would otherwise have taken? Have the large exposures provisions impacted your business decisions? If so, in what way (e.g. competitiveness, cost, management time, opportunity cost/gain)? If an international institution, please also explain in global context.
- The consistency of current regulatory limits with internal management practices? To what extent do you use the information that you supply to meet the regulatory requirements for large exposures, and the systems that you use to capture and process that information, in your own risk management?

We think that, in principle, the Large Exposures regulation is an effective view of dealing with single-name concentration risk. As described above, it is closely integrated in the Bank's current credit process. It also ensure a level playing field in domestic and international market.

Current regulation, however, can be improved by making risk sensitive the weights to be assigned to the exposures, consistently with the general philosophy of the Basle 2 framework.

In particular, we are in favour to the application of the Basle 2 Standardised approach to measure risk exposures, that is differentiating risk weights according to counterparts agency rating. This system would have also the benefit of concentrating the exposures, within the counterparts group, to the rated companies, which are generally the most marketable names and can be more easily hedged or sold to the secondary market when necessary.

On the contrary, we believe that sector and regional concentration risks are too complex to deal with a simple and levelling-playing-field set of rules, because they depend on the whole portfolio structure and must be analysed with sophisticated tools, such as portfolio models. As a consequence, supervision on these types of risks should be submitted to the Pillar 2 framework and the SRE process.

17. What is your perception of how the large exposures regime is applied across different member states? Is it applied in a consistent way? If not, what differences have you encountered and how have they impacted on your business.

Sanpaolo IMI Group has a limited number of subsidiary at the international level. So we have a very limited direct experience of other supervisory approach to concentration measurement and control. Having a look to the overall economic and financial picture, some concentration are rising up and down the world, particularly for some big international banks that are deeply involved in specific products market making. According with some international statistics, only few investment banks are operating on the credit derivatives market providing protection for a relatively small number of names but on an enormous notional amount.

Regulation on concentration limits in a globalised environment is essential because capital market is intrinsically globalised and breaches in some part of the market could hurt the system as a whole.