BEST PRACTICE GUIDELINE

From the Banking Regulation and Supervision Agency:

GUIDELINE ON THE MANAGEMENT OF CONCENTRATION RISK

FIRST PART

Objective, Scope and Definitions

I. PURPOSE AND SCOPE

1. The purpose of this guideline is to explain the best practices expected from banks regarding the management of concentration risk, within the framework of the article 35 entitled "Purpose of Risk Management and Implementation of Risk Management System" of the "Regulation on Internal Systems and Internal Capital Adequacy Evaluation Process of Banks", published on the Official Gazette number 29057 dated July 11, 2014.

2. The Guideline was prepared based on the article 7/A entitled "Best Practice Guides" of the "Regulation on the Principles and Procedures Concerning the Audit to be Realized by the Banking Regulation and Supervision Agency", published on the Official Gazette number 26236 dated July 22, 2006 and article 93 of the Banking Law number 5411 dated October 19, 2005.

3. Principles concerning concentration risk management taking place in this guideline were discussed under following main titles:

* Definitions regarding concentration risk,

* General principles concerning concentration risk management,

* Issues concerning concentration risks emanating in specific risk types.

4. It is expected that issues taking place in this guideline to be implemented in consolidated and non-consolidated basis, considering the complexity and size of bank's activities.

II. DEFINITIONS

5. The following terms used in this guideline shall have the meaning expressly designated to them below:

a) Emergency and contingency plan: Emergency and contingency plan defined in the article 3 of the Regulation on Internal Systems and Internal Capital Adequacy Assessment Process of Banks,

b) Contagion risk: Risk emanating from a development causing the decrease of credit ratings and credit crunch occurred in a country to affect other countries in the same region and/or

having similar economic structure (whether or not it has direct relationships with credit notes or the development itself),

c) Funding liquidity risk: Default risk of the debts and liabilities without being exposed to any unexpected loss and without falling in default,

d) Business continuity plan: Business continuity plan as defined in the article 3 of the Regulation on Internal Systems and Internal Capital Adequacy Evaluation Process of Banks,

e) Counterparty credit risk: Counterparty credit risk as defined in the article 3 of the Regulation on Internal Systems and Internal Capital Adequacy Evaluation Process of Banks,

f) Liquidity horizon: Liquidity horizon as defined in the article 3 of Communiqué on Measurement of Market Risk using Risk Measurement Models and Evaluation of Risk Measurement Models,

g) Model risk: Risk emanating from models used by banks to measure their risks and evaluate their financial products failing to reflect the risks exposed adequately and accurately,

h) Concentration in single risk basis: Risk concentration appeared from the interaction of different risk position within a determined risk category,

i) Special-purpose securitization company: Special-purpose securitization company as defined in the article 3 of the Regulation on Internal Systems and Internal Capital Adequacy Evaluation Process of Banks,

j) Market liquidity risk: Risk that a position cannot easily be unwound or offset at short notice without significantly influencing the market price because of inadequate market depth or market disruption,

k) Concentration between risk types: Risk concentration appeared from the interaction of different risk positions within different risk categories,

l) Systemic risk: Risk that problems appearing in the whole or in a considerable part of financial system cause the interruption of financial services to the extent that creates significant negative results on markets and/or real economy,

m) Specific risk: Specific risk as defined in the article 3 of the Regulation on Measurement and Evaluation of Capital Adequacy of Banks,

n) Top-level management: Top-level management as defined in the article 3 of the Regulation on Internal Systems and Internal Capital Adequacy Evaluation Process of Banks,

o) Senior management: Senior management as defined in the article 3 of the Regulation on Internal Systems and Internal Capital Adequacy Evaluation Process of Banks,

p) Concentration risk: Risks emanating from the concentration creating important losses which may threaten a bank's financial structure or ability to pursue its basic activities or which may lead to significant changes in the bank's risk profile, based on different risk types or single risk.

SECOND PART

General Issues

6. Concentration risk is one of the reasons for which a bank may be exposed to loss. Banks shall give special importance to concentration risk to pursue their activities in a sound and reliable way.

7. In case banks don't take concentration risk into account sufficiently, concentration risk shall be pointed out and banks shall reserve additional capital considering the business models they use as well as their fragilities, within the scope of Internal Capital Adequacy Process (ICAP), if required.

8. Since credit allocation is the main activity of banks, credit concentration causes the most important risk concentration for banks. Therefore, concentration risk is mostly related to credit risk. However, concentration risk is not limited only to risks caused by credits allocated to individuals or companies; it may also be related to other important risks concerning asset and liability items which may threaten bank's financial soundness due to disruptions in some markets, sectors, countries or activity fields.

9. In their concentration risk management, banks shall use a totalitarian approach which detects and evaluates all risk concentrations; because a single transaction or activity emanating risk may cause losses and negative results in more than one risk category. Analyzing single risk type is not enough to determine a bank's concentration risk; concentration risk between risk types shall also be analyzed.

10. Concentration risk may originate from related factors which cannot be easily understood and detected without realizing an application involving all of the processes of detecting, managing, monitoring and reporting this risk. Basic principle shall be to prevent concentration risks before they are realized and detected by internal control/internal audit personnel, with a proactive approach.

11. In evaluation of a bank's both domestic and abroad concentration risks, circumstances which may lead to concentration risk in determined fields, products or markets due to the business model and strategies used by bank within the group shall be separately taken into account.

12. According to the principle of proportionality mentioned in the article 7/A entitled "Best Practice Guides" of the Regulation on the Principles and Procedures Concerning the Supervision to be Conducted by the Banking Regulation and Supervision Agency, it is expected from banks to implement the principles in this guideline considering their own scale and risk profile, as well as the volume, nature and complexity of their activities and transactions. It is possible that small-scaled banks with simpler structures focus on more qualitative factors when it comes to concentrations between risks. However, banks with more complex structures shall consider both single risks and concentrations between risk types using internal models involving qualitative and quantitative factors.

13. For small-scaled banks with simple structures, concentration risk is mostly related to credit risk, while for large-scaled banks conducting complex activities, it may be related with all market, credit, operational and liquidity risks. Furthermore, excessive concentrations may be seen in some banks, business lines, products or geographic regions. These banks, even if they have the best knowledge, expertise and experience amongst the related market or product groups, they may be affected more from possible problems emanating from a determined market or product, so they have to show more sensitivity to concentration risk and handle it more prudently.

14. The principle of proportionality shall be taken into account when analyzing concentration risks in both consolidated and non-consolidated basis. Some concentrations may appear in the levels of business lines or individual legal entities, as a result of group diversification policy.

15. Interaction between different risk positions may be emanated from a common risk factor but also from the interaction between different risk factors.

16. Concentration between risks may also appear when risks arising from an institution or affiliated risk groups (companies operating in the same sector or geographic region) are not accounted within the same item (e.g. some risks arising from a bank take place in banking accounts, while others in purchase and sale accounts). When a common risk factor causes the risks to trigger one another continuously and simultaneously, the correlation between risk positions which is considered to be low may realize in high levels in stressed periods.

17. Concentration risk may affect the bank's capital, liquidity and incomes. These situations are not interdependent and shall be handled adequately within the framework of risk management.

18. In addition to concentration in single risk type basis and concentration between risks, concentrations may also be seen in a bank's incomes structure. For example, a bank which is highly dependent on the profit obtained from a single business line or geographic region may be affected highly from sectoral or regional conjuncture fluctuations. Different income sources belonging to a bank may be interdependent. These interdependences shall be taken into account in the evaluation of concentration risk.

19. Even if the expertise in some cyclic fluctuations, business lines or geographic regions affects positively the banks' performances, the concentration in business lines may increase their fragility. Thus, a balanced point of view shall be developed when evaluating concentration risk.

THIRD PART

Concentration Risk Management

Principle 1. Concentration risk management shall be adequately handled within the the bank's written risk management framework.

20. In the bank's risk management framework, the personnel and units responsible for the management of concentration risk shall be specified clearly; written policies and procedures regarding the detection, measurement, monitoring, reporting and management of concentration

risk shall be developed. These policies and procedures shall enable the bank to intervene efficiently and timely in risk concentrations.

21. The board of management shall understand and assess the concentration risk to which the bank is exposed due to business model used and activities conducted.

22. Banks shall indicate quantitatively and qualitatively their concentration risk appetite, in other words the level of concentration risk to which they will be exposed because of risks they are willing to take, considering factors such as their size, business line type and geographic distribution of activities, in addition to other related factors.

23. Concentration risk framework shall be put in writing as to include concentrations in single risks and between risk types in a consolidated and non-consolidated basis; and this framework shall be integrated to the bank's risk management culture. Concentration risk framework shall also be reviewed regularly considering the changes in the bank's risk appetite and activity field.

24. Situations constituting contradictions to the policies and procedures determined within the concentration risk framework shall be put in writing and reported to the related administrative level. The bank's units independent from execution such as risk management unit shall follow these contradictions including limit exceedings. Contradictions such as limit exceedings which may appear in the practice of policies and procedures shall be subjected to appropriate exceeding criteria.

Principle 2. Banks shall have a wholistic approach taking into account all the aspects of concentration risk in single basis and inter-risk concentrations, to be able to manage appropriately concentration risk.

25. Concentrations in single risk basis shall be calculated separately or integrated to a risk management system involving detection, measurement, reporting and management of risks (credit, market, operational risks, etc.).

26. Concentrations arising from the dependences between risk types may not be handled accurately by directly aggregating risks defined and measured separately (e.g. by aggregating values exposed to direct risk). Because in this situation, concentrations between risk types emanated by single risk factors in different business lines may not be taken into consideration. Banks shall have policies to define this kind of factors and how they might affect various risk types. Moreover, how risk mitigating techniques might remain ineffective in bad market conditions shall be taken into account.

27., Banks shall also take their past experiences into account in the wholistic approach to concentration risk management. In other words, indirect effects of changes in economic environment on banks' risks shall be taken into account. For example, following sudden falls in the value of some assets, if these assets are not disposed of, additional losses may occur; in this situation, concentrations between risk types may be distinguished clearly.

Principle 3. Banks shall have a framework by which the concentrations based on single risk type and inter-risk types are defined and measured.

28. Risk factor which may cause concentration risk shall be determined. Furthermore, in the framework defining concentration risk, all risk concentrations significant to the bank (e.g. risk types, business lines and firm details of on and off-balance sheet positions, committed or uncommitted receivables) shall be detectable. Banks shall have adequate data management systems to detect concentrations arising from different risk types. Components of concentration risks which are not handled adequately using existing models shall also be detected.

29. Since banks are not independent from the environment in which they are operating, they shall also take into account economic developments affecting or affected by financial markets and their participants, as to facilitate the detection and interpretation of possible concentrations risks in consolidated and non-consolidated basis. (A risk concentration badly managed in an affiliate may seem insignificant in consolidated basis but might threaten the affiliate's financial capacity.) Another important issue is the analysis of the interactions throughout financial sector and the effects of their results on banks. In this process, banks shall go beyond first level observations and implement concentration risk management with a future-looking approach, not contenting to just monitor the changes in economic conjuncture.

30. Stress tests realized using both sensitivity tests and scenarios are the most important tool to detect concentration risks. Stress tests are also realized with a totalitarian point of view, considering different risk types in addition to concentrations specific to business lines or risk types. In the composition of stress test program to be applied for concentration risk, banks shall also take into account the principles and procedures taking place in the "Guideline on Stress Tests to be used by Banks in Capital and Liquidity Planning". Moreover, stress tests may also help detect the dependences between risks in bad market conditions in which complex chain reactions such as secondary, tertiary ext. circumstances occur and banks are obliged to dispose of their assets, or contagion risks appear.

31. Usage of stress tests in detection of concentration risks does not mean that only stress tests shall be used in concentration risk management. Some special sensitivity tests targeting to reveal determined concentration behavior based on single risk types or on a portfolio may also increase the bank's knowledge on concentration risk. On the other hand, totalitarian stress tests analyzing the risks to which the bank is exposed all across the bank might be especially beneficial in detection of concentration risks.

32. When they are planning to enter to new activities, banks shall detect risks arising especially from new products and markets.

33. Using this framework, banks be able shall evaluate and measure timely and reliably the effects of risk concentrations on profitability, solvency power, liquidity level and legal legislation compliance. The frequency of measurements shall be in proportion with the size and complexity of bank's transactions. Banks shall also be able to measure risk concentrations based on net/gross and before/after risk mitigation.

34. Measurement framework shall be reviewed regularly and shall reflect the changes in the bank's field of activity, but also possible changes in the bank's risk profile considering its future activities.

35. More than one method or measurement may be needed to see accurately different components of risk. Scenario analyses might be an appropriate tool to compose a future-looking approach, because they bring a new point of view regarding possible developments in financial market and economy for the bank's risk measurement methods and they gain this point of view to the bank's risk terminology. When realized independently from direct aggregation methods, scenario analyses might be beneficial for reviewing these methods.

36. The board of management shall be aware of significant limitations and basic assumptions within measurement framework. In case method usage is preferred in concentration risk management, the risk management unit shall apply especially stress tests and consider all limitations and assumptions of these models, as well as their calibrations.

FOURTH PART

Management of Concentration Risk Monitoring, Control and Mitigation Processes

Principle 4. Banks shall have adequate regulations for active monitoring, control and mitigation of risks. Banks shall use appropriate internal limitations, threshold values and similar applications in concentration risk management.

37. Active management of risks helps reducing the possibility of undesired concentrations in receivables within the portfolio. However, active risk management may also trigger consecutive risks which are difficult to manage (e.g. not being able to dispose of assets). Furthermore, to prevent long-term undesired risk concentrations, business targets and strategic targets shall be reviewed regularly and necessary corrections shall be made for them.

38. Banks shall determine top-bottom and group-based concentration risk limits (including appropriate sub-limits concerning business lines, institutions and risk types) for receivables belonging to a specific product or markets, alongside with receivables from counterparties and groups in sectors and industries basis.

39. Limit applications and ratios composed shall reflect the bank's risk appetite and the dependences based on and between risk factors shall also be taken into consideration. Limit applications shall include the structure of on-balance sheet and off-balance sheet positions as well as assets and liabilities, both on consolidated and non-consolidated basis. These applications shall be put in writing and announced to all related units within the bank.

40. Analyses including trend estimations for portfolios and receivables shall be realized regularly and the results of these analyses shall be taken into consideration in composing limits, threshold values and processes and approving their adequacy within the scope of concentration risk management. Such an analysis shall at least involve following applications:

* Detailed analysis of risk situation in a determined sector(s),

* Detailed review of economic performances of debtors,

* Review of hierarchical approval levels concerning activities,

* Review of risk mitigation tools, as well as their values and legal sufficiency,

* Review of agreements made with third parties support service activities,

* Review of funding strategy, and thus ensuring the efficient diversification of fund flow and resources,

* Review of activity strategy.

41. Once risky fields are identified, banks shall take appropriate risk mitigation measures. Some of the possible measures are given below:

* Decreasing limits and thresholds regarding risk concentrations,

* Changing business strategy as to reduce excessive concentrations,

* Diversifying asset composition or funding resources,

* Purchasing protection (e.g. credit derivatives, collaterals, guarantees, etc.),

* Disposing of some assets,

* Changing support service agreements.

42. Limits regarding concentration risk related to funding may involve following:

* Limits regarding funds provided from interbank markets,

* Limits regarding maximum or minimum average maturities.

43. Following limits limiting liquidity concentration may also e taken into account:

* Limits regarding maturity mismatch, especially limits regarding cumulative liquidity gaps,

* Limits regarding off-balance sheet positions.

44. Alongside limits, indicators and triggering levels adjusted according to determined thresholds are also useful instruments and they are generally determined more prudently comparing to limits. Moreover, these instruments act as warning mechanisms when limits are approached and make sure that necessary measures are taken to prevent limit exceedings.

45. Risk mitigation techniques used by banks shall be adequate, manageable and understood perfectly by related personnel. Banks shall not completely stick to specific risk mitigation instruments when mitigating their concentration risk; they shall not cause concentration in risk mitigation instruments, considering the characteristics and quality of these instruments.

46. Banks shall be attentive to not entering into products and activities in which they are not adequately specialized in, or not complying with their structures, business models or risk appetites. Risk mitigation strategy may cause redundant diversification in some circumstances. For example, diversification of low-quality risk mitigation instruments instead of concentration in good-quality instruments (just to perform diversification) may cause the increase of total risk. Mitigation of concentration risk shall not cause the increase of total risk of receivables within the portfolio. In other words, the quality of risk mitigation instruments used shall be equal or superior to the quality of original receivables.

47. Banks shall have a system to report concentration risk regularly. This system shall ensure that the information about risk levels regarding concentration risk is transmitted timely, accurately and comprehensively to senior management and related units.

48. Banks shall have a reliable, actual, comprehensive monitoring and reporting framework ensuring effective decision-making in the management of concentration risk. This framework might be a part of the bank's existing monitoring and reporting framework. Reports presented to senior management shall involve information on basic risk factors and risk mitigations made, but also qualitative and if possible, quantitative information on single risk types and concentrations between risks. Reports shall include information appropriate to monitor limit structures, activity fields, geographic region and institutions on consolidated and non-consolidated basis.

49. Banks shall be able to detect and consolidate similar risk positions throughout the bank, including different legal entities, receivable classes (e.g. credits, derivative products, structured products etc.) risky activities (e.g. purchase and sale accounts) and geographic regions using information systems and risk management processes. Typical circumstances in which risk concentrations may be formed might be as following:

* High amounted credits allocated to the same counterparties,

* High amounted credits allocated to groups composed of counterparties having risk relationships,

* Credits allocated to counterparties located in the same economic sector or geographic region,

* Credits allocated to groups composed of counterparties conducting the same services or products or appealing to the same risk mitigation methods,

* Credit risks exposed indirectly because of using just one type of collateral or credit protection,

* Risks/market risk arising from purchase and sale account,

* Counterparty risks arising from the execution and pursuance of transactions,

* Fund resources,

* Assets kept in banking or purchase and sale accounts, such as credits, derivatives and structured products,

* Off-balance sheet receivables.

50. The frequency of reporting shall be dependent on the importance, structure and especially volatility of risk factors. To support regular reporting, additional reporting shall be made in stress test periods.

51. Banks shall have information management systems to watch risk concentrations occurring in different receivables, within the aim of monitoring their approved risk limits. Reports composed to monitor limits shall be added to managerial reports and to activity reports belonging to personnel using the limits. Banks shall have limit exceeding procedures to detect and intervene timely on their limit exceedings.

Principle 5. Banks shall ensure that the concentration risk is also handled within Internal Capital Adequacy Assessment and within capital planning framework (ICAAP). Most particularly, the capital amount shall be in a level to carry concentration risks within the portfolios.

52. In evaluation of capital adequacy within the scope of ICAAP, banks shall also take into account concentration risk. Moreover, banks shall show that their capital adequacy evaluations are also comprehensive and adequate for concentration risks. If a bank is able to show that its concentration risks (single risk type basis and inter-risk types) is comprehended sufficiently within the frame of capital adequacy, it might be unnecessary to reserve capital for concentration risk as if it's a separate risk category, by the models used within the scope of ICAAP. However, in any case, internal capital calculated shall comprehend all risks exposed by bank, including all single risk type basis and inter-risk concentrations.

53. Banks shall take into account risk mitigation in the evaluation of concentration risk evaluation concerning all receivables. In evaluating risk mitigation, some related factors such as the efficiency of the actions taken to adjust concentration risk level, including the quality of risk management, internal control and internal audit systems.

54. Even if internal capital is evaluated in a comprehensive way, the importance attached to different sectors may vary from bank to bank. However, the bank's responsibility to show the adequacy of its internal capital measurement and evaluation systems is as high as its concentration risk.

FIFTH PART

Management Of Concentration Risk Based On Single Risk Types

Credit Risk

Principle 6. Banks shall derive a concise and practical definition of which type of activities and circumstances constitute credit risk concentration.

55. This definition shall encompass following types of credit risk concentrations as a minimum:

* High amounted credits allocated to the same counterparties,

* High amounted credits allocated to groups composed of counterparties having risk relationships,

* Credits allocated to counterparties located in the same economic sector or geographic region,

* Credits allocated to groups composed of counterparties conducting the same services or products or appealing to the same risk mitigation methods,

* Credit risks exposed indirectly because of using just one type of collateral or credit protection.

Principle 7. Banks shall use methodologies and tools to identify systematically their overall exposure to credit risk based on counterparties, products and geographic region.

56. The system built to consolidate credit risks and manage credit risk limits shall be adequate to handle and monitor the obligor with a wide point of view, based on bank's activities in general. In other words, during the monitoring of a company with regard to credit risk concentration, this system shall enable to monitor not only credits allocated to that company, but also risks of companies related or affiliated to that company.

57. For example, banks providing protection with non-cash loans such as letters of guarantee or derivative financial instruments such as credit default swap may have more than one and complex bank-obligor relationships, unlike cash credit allocations. Accordingly, during credit concentration management, and especially during risk monitoring in consolidated basis, these situations shall be handled attentively.

58. Credit concentration risk may also arise from structured financial products such as securitizations.

59. Credit concentration risk may also arise from banking accounts, purchase and sale accounts or from the combination of these two portfolios. Within this scope, counterparty credit risk and specific risk shall also be taken into account in calculating credit concentration related to purchase and sale accounts.

60. Interdependence formed between lenders because of counterparties shared by supply chains, partnerships and guarantor relationships (for example, situations in which one than one bank are partners or guarantors of the same counterparty) beyond sectoral and geographic relations may only be seen clearly in the times of economic fluctuations or crisis. Accordingly, it is important that stress tests are used to measure the size of various concentrations hidden in credit portfolio.

61. Bank management shall conduct regular stress tests for significant concentration risks of the bank and evaluate the results of these tests to determine the changes in market conditions which may affect negatively the bank's performance and to take necessary measures for them.

Principle 8. Models and indicators used by banks to calculate credit concentration risk shall appreciate sufficiently the dependence between credits.

62. Model risk is an important risk which shall be taken into account in the modeling of credit concentration risk. The type of the model used to estimate the dependence between parties granted credit is an important factor to calculate this dependence. Models may have basically different structures (e.g. structured models face to reduced models) or may work in different setups (standard model "default mode" face to "mark-to-market" mode calculating according to market value). Since the selection of model has grand effect on the bank's credit concentration risk evaluation, it is important that banks have fully understood the techniques and assumptions on which these models are based.

63. Banks shall manifest that the models they use are appropriate for the characteristic features of their credit portfolios and that they measure correctly the dependence relationship between credit risks. All models may not calculate accurately and equally the different types of dependence relationships. Consequently, models which are not appropriate for characteristic features of portfolios may calculate credit concentration risk lower than it really is.

64. For example, when modeling dependence relationship regarding receivables such as retail SME in which no sufficient market data is available, banks may generally be obliged to use data which do not represent these receivables at all. Moreover, assumptions used to calculate dependence relationship between debtors may only be sufficient for small scaled and regional calculations or disregard the risks which may arise in stress conditions.

65. Another important issue is that the sample period used to make the model calibration shall be adequate enough to reflect perfectly crisis conditions and to produce sound estimations. In cases where time series used especially in calculation don't comprise years of economic decline, banks shall prove that they act prudently in this subject.

66. Another difficulty faced in calculating credit concentration risk appears in the course of consolidation of different type of credits allocated to the counterparty within the bank. For example, a credit may be allocated to a customer within the scope of banking portfolio, but also purchase and sale aimed derivative transactions may be realized with this customer. Accordingly, consolidation of different type of credits with an appropriate method shall be made attentively any transaction which may be related to credit concentration risk shall not be excluded in the calculation.

Market Risk

Principle 9. Banks shall detect, measure, monitor and report their market concentration risks.

67. Concentrations in market risk may appear in positions relating to one risk factor or positions relating to numerous risk factors having correlations between themselves. Correlation between

risk factor may always be visible and this situation may appear only in bad market circumstances.

68. Banks shall detect all significant risk factors and shall especially analyze the value of their portfolio and how its market risk profile is affected from correlation variations and non-linear variations by stress tests and sensitivity analyses.

69. Many banks use the Value-At-Risk (VaR) models and limits to monitor positions exposed to market risk. VaR models may use correlations not exposed to risk amongst risk factors. However, the levels of interdependence may change in bad market circumstances and the effect of diversification on purchase and sale accounts may seem higher than it really is. Furthermore, the prices used in models may not be based on real market prices; they might be obtained by valuation techniques based on market observations. Additionally, these prices might be based on assumptions not based on observations and having limited validity in the periods of stress. Accordingly, the real concentration risk of a product may be disregarded. Concentration risk may also appear as a result of the activities of other market participants'. Systemic risk may also be a significant source of concentrations and this situation may be neglected in models.

70. Traditional VaR models may not comprehend all market risk concentrations appeared especially in negative market conditions. The bank's VaR measurement may not reflect bad market conditions and thus concentrations may not be detected. Monitoring of positions in net basis may cause the large gross positions increasing highly concentration risk to hide. Consequently, measurements used to monitor concentration risk shall be adequate enough to notice and detect the increase of positions concentrated in one or more than one risk factors.

71. Within the scope of market risk concentration, concentrations based on risk type (interest, exchange rate, etc.), risk factor, yield curve, product (security, swap, option etc.), type of currency, geographic region and markets shall also be detected, managed efficiently and reported to related units.

Principle 10. In evaluating concentration risk, banks shall take into account also possible effects of different liquidity horizons which may vary through time.

72. Banks shall evaluate concentration risk using different liquidity horizons. When the possible effect of market liquidity on concentration risk is taken into account, attentive evaluations of liquidity horizons in both positive and negative market conditions are needed. Moreover, this issue shall also be taken into account when determining the bank's risk limits.

Operational Risk

Principle 11. Banks shall fully understand all aspects of operational risk concentration (OPRC) relating to their transactions.

73. OPRC are single or group concentrations which may compose losses to the extent causing the bank's general risk profile to get worsen and thus threaten the bank's financial situation as

well as its ability to pursue its basic function. The correlation between risk factors may not always be visible and this situation may be revealed only in bad market conditions.

74. Banks shall define basic sources creating OPRC as a part of their operational risk management framework. They shall clearly analyze both realized and possible effects of OPRC.

75. All sources which may create OPRC shall be considered. Banks shall take into account that these sources may be related to bank's activities or characteristic of its organizational structure.

76. For example, banks having large payment, settlement and trading activities or depending on one or more than one supplier for their basic needs (companies presenting information systems, insurance or support services) are potentially exposed to OPRC.

77. Other possible sources of OPRC (e.g. decision to conduct "aggressive sale" campaign which may bring losses due to difficulties in refunds to clients) may be diagnosed more clearly because of their negative results and effects on the bank's general risk profile.

78. Many high frequency/medium impact (HFMI) and low frequency/high impact (LFHI) loss events may be classified as OPRC. The frequent repetition of medium impact events may jeopardize the bank's survival, if they remain unmitigated. On the other hand, events with low possibility to occur but having high effect may cause the immediate default of a bank.

79. Even if all HFMI and LFHI events are not connected with OPRC, their proper recognition and treatment is crucial to understanding the operational risk profile of the bank. However, if HFMI and LFHI events have a common cause such as insufficient control or inadequate procedures, they should be considered as contributing to concentration risk.

80. Frequently the HFMI and LFHI events stem from "multiple time losses" and "multiple effect losses"[1]. Since such losses usually qualify organizational changes and mitigation actions for operational risk, banks shall define appropriate principles and set specific criteria and examples to correctly identify, classify and treat "multiple time losses" and "multiple effect losses" within their business and organizational structure.

Principle 12. Banks shall use appropriate tools to assess their exposure to operational risk concentration.

81. Banks shall take into account possible risk concentrations when they evaluate their operational risk exposure. The assessment tools shall be proportionate to the size of the bank, to complexity of their transactions and to the method of calculating the operational risk capital figure.

82. In particular the analysis of patterns of frequency and severity of loss data (internal and/or external) can reveal the major determinants and effects of OPRC.

[1] "Multiple time losses" define a group of subsequent losses occurring in different periods of time but relating to the same operational risk event; "multiple effect losses" define a group of associated losses affecting different entities or business lines, units, etc, but relating to the same root event.

83. Near misses and also operational risk gains on one hand and scenario analysis or similar processes containing expert judgments on the other can give a more forward looking perspective on the exposure to OPRC inherent in the current environment or related to new areas of business, changes in the bank's structure, or recent management decisions, etc.

84. Operational risk managers and internal control functions shall be included within the bank's operational risk concentration exposure assessment, where appropriate. The collection of loss data shall also be included within this assessment.

85. Sound internal processes, internal systems and sufficient human resources are crucial to avoid unnecessary risk concentrations. On the other hand, since banking transactions will always be exposed to operational risk concentration, appropriate internal control systems are crucial to mitigate those risks.

86. Banks shall compose contingency and emergency plans and continuity plans in order to ensure their capacity to operate on a continuous basis and to prevent losses due to interruptions of their activities. These plans are crucial for concentration risk management, especially with regard to events with a low probability of occurrence, but associated with severe losses resulting from business disruptions.

87. Operational risk concentration may be addressed by the use of risk mitigation techniques. For example, insurance policies may be developed for losses caused by fraud, an aggressive selling campaign or the inability of external providers to offer their services.

88. The usage of risk mitigation techniques may cause the appearance of other risk types (e.g. credit risk) that may render overall risk reduction less effective (e.g. legal risk other additional operational risk). The appearance of new risks may be considered as a secondary operational risk concentration. Such a concentration risk may arise is a bank insures its risks or concentrated risks at only one insurance company which either does not have sufficient capacity to cover all the different operational risks transferred by the bank or is not able to find eligible co-insurers and re-insurers to pool and share those risks.

89. If risk mitigation techniques are used for operational risk concentration, the bank shall also consider the residual risk and additional risks relating to risk mitigation tools, including operational risk concentration itself.

Liquidity Risk

Principle 13. Banks shall fully understand their funding and asset structures in order to detect all significant types of liquidity risk concentrations and shall be aware of all basic factors affecting these structures over time. Depending on the business models they use, banks shall be aware of the weaknesses emanating from their funding and asset structures. For example, large concentrations in ratios of retail and wholesale funding amounts within total liabilities located in the liability's side of the balance sheet, or in a single security within the liquidity buffer shall be prevented. Moreover, in determining

liquidity risk concentrations, regional characteristics shall be analyzed and off-balance sheet commitments shall also be considered.

90. Concentration risks may be a major source of liquidity risk as concentrations in both assets and liabilities can lead to liquidity problems. Asset concentration may disrupt the bank's ability to generate cash in times of illiquidity or reduced market liquidity for certain asset classes. Liability concentration (or funding concentration) occurs when the bank's funding structure is vulnerable to a single event or factor, such as a significant and sudden withdrawal of funds or inadequate access to new funding. The amount of concentration occurred in a fund expresses the amount which will require the bank to change significantly its daily funding strategy by itself or at the same time as similar or correlated funding sources.

91. In recent years, the increase of the usage of complex financial products and the globalization of financial markets were accompanied by a shift from deposit based to market-based funding. Due to the increasing dependence on wholesale funding, banks became more sensitive face to credit volatilities and market prices. Additionally, the extension of interbank activity brings the risk of contagion effects.

92. In identification process of liquidity risk concentrations needs to take into consideration both market liquidity risk and funding liquidity risk as well as their relation with each other. In liquidity risk management, banks shall be able to manage their liquid asset stock as to ensure to the maximum extent of liquids possible in bad market conditions. They shall avoid large concentrations in less liquid asset classes relative to their long-term stable funding. Otherwise, in a market downturn this may severely damage the bank's liquidity generation capacity.

93. High concentrations in wholesale funding generally increase liquidity risk. Because wholesale funding providers are more sensitive to credibility and more likely to believe in market rumors about financial difficulties of a bank than retail funding providers. Interbank funding entails contagion risk and may be a volatile funding source, especially in times of crisis, when confidence among banks is lost and they become reluctant to lend to each other. When assessing the probability of withdrawal for each concentrated source of funding both behavioral and contractual considerations shall be taken into account.

94. For banks active in multiple countries and currencies, access to diverse sources of liquidity in each currency in which the bank holds significant positions is required; because banks are not always able to swap from one currency to another.

95. In various country regulations, there might be regulatory provisions restricting the ability of allocating assets where they are most needed, concerning the free flow of assets between those countries (e.g. tax issues, legal ring-fencing). Banks shall be able to detect liquidity concentrations between the head office and foreign branches, or between parent bank and ist subsidiaries or among different subsidiaries.

96. Another important factor influencing liquidity risk concentration is off-balance sheet items. Off-balance sheet liquidity needs may arise both from contractual and non-contractual commitments. Off-balance sheet contractual commitments may include such items as

commitments to provide financing, guarantees and credit limits. Provisions in securitization contracts shall be analyzed in the sense of performance decrease triggering collateral and liquidity support or note reduce. Especially in bad market conditions, the requirement to support institutions such as securitization companies may appear unexpectedly in order to provide a good reputation, market share or business relations and this situation may threaten severely the bank's liquidity level. Possible liquidity requirements which may appear relating on the execution of such off-balance sheet commitments shall be assessed regularly. The possibility of early repayment of debt instruments (instruments callable or with trigger clauses) shall also be considered.

Principle 14. Banks shall monitor actively the funding sources in identifying their exposure to funding concentration risk. All factors which may deteriorate their access to funding sources or trigger a significant sudden withdrawal of funds shall be comprehensively analyzed.

97. There are no fixed thresholds or limits that define a funding concentration arising from the bank or its balance sheet structure. Concentration examples relating to funding are as follows:

i. Concentrations in one particular market or product:

* Inter-bank market,

* Funding through debt issuance (commercial paper, medium-term notes, subordinated debts, etc.),

* Other wholesale funding (funds provided from large companies or corporate investors),

* Structured instruments (FX swaps, asset-backed commercial paper, mortgage bonds), liabilities arising from collateral and margin calls.

ii. Concentrations in secured funding sources:

* Securities financing arrangements such as repurchase/reverse repurchase agreements, stock borrowing/lending and specific assets used in these operations,

* Asset-backed commercial paper,

* Securitization of receivables (credit cards, mortgages and vehicle loans, etc.),

* Certain types of mortgaged bonds,

* Dependence on open market operations.

iii. Concentrations on a few providers of liquidity: Dependence on a few providers of liquidity may form even if different markets or products are being used. Without a specific concentration risk analysis, the concentration on a few providers of liquidity could be less visible and difficult to identify. These concentrations may arise from:

* Wholesale funding providers (funds provided from large companies and corporate investors),

* Funding from the financial group the bank belongs to,

* Large individual depositors or counterparties,

* Connected counterparties,

* Geographic and/or currency concentrations of funding sources.

iv. Maturity concentrations; over-reliance on short-term funding to finance longer term lending: maturity mismatch is an inseparable part of banking and problems may arise if banks don't renew their short-term liabilities. Another type of maturity concentration occurs when similar maturity dates of different funding sources require the bank to issue a larger number or amount of debt instruments in a short period of time, leading to difficulties in market absorption.

Principle 15. Qualitative assessments of liquidity risk concentrations shall be complemented by quantitative indicators used to determine the level of these concentrations.

98. One example of quantitative indicator is the ratio of wholesale funding to total liabilities. This ratio shows the extent to which the bank is dependent on market funding sources (more volatile and more vulnerable). Another example is the percentage of the largest five deposits within total deposit.

Principle 16. Banks shall take into account liquidity risk concentrations when setting-up their contingency funding plans.

99. When setting-up their contingency funding plans, banks shall consider:

* Early warning indicators detecting any increase in the concentration of liquidity risk as well as the measures are taken in a crisis situation,

* Attentive monitoring of any increases in concentration level arising from the implementation of contingency measures and reducing such increases as soon as possible.

100. Among the early warnings cited above, there are also indicators monitoring breaches of concentration limits (e.g. limits based on assets having individual issuer, sector, liquidity credit, different rating notes).

101. Measures to be taken to pursue funding diversification in a crisis situation triggering early warning indicators relating to concentration are also among the strategies to be implemented.

ANNEX 1. EXAMPLES OF CONCENTRATION RISK

1. Examples of concentrations amongst risk types observed in the global financial crisis of 2007-2008:

In the global financial crisis of 2007-2008, as it can be understood from the gradual increase of risks and losses due to single risk factors or the interaction of these factors, it was clearly seen that concentrations may occur between risk types within financial institutions in general. Interactions between risk types and difficulties in measuring and managing risks under these conditions can give rise to the rapid growth of unexpected risk positions and losses.

Severe doubts about the credit quality of US sub-prime mortgages coupled with valuation difficulties and uncertainties about the adequacy of credit rating agency ratings led to a severe drop in investor demand. This left securitization founder institutions and sponsor institutions with the inability to transfer assets to the securitization markets and unexpectedly concentrated exposures to assets whose values were sensitive to market variables, credit quality and asset liquidity changes. Moreover, due to the uncertainties about collateral quality, the asset-backed commercial paper (ABCP) markets also seized up. The freezing of ABCP markets led to some funding difficulties for certain financial institutions, forcing some to draw on their liquidity lines and/or to shorten the maturity of their debt. These concentrated funding exposures to short-term horizons increased the fragility of the liquidity position. Sponsor institutions with large assets were faced with a build-up to exposures to structured credit assets and further pressure on liquidity positions. The increase in risk aversion, the steep rises in some reference interest rates and credit and liquidity hoarding led to forced asset sales and subsequently to severe price decreases in multiple asset classes (equity, traded credit, corporate bonds, etc.) These falls in asset values often provoked additional collateral requirements leading to further deterioration in the liquidity situation of banks. This general liquidity squeeze, the uncertainties about financial institutions' own contingent exposures and heightened counterparty risk concerns brought the inter-bank market to a standstill. Hedging the credit and market risks proved extremely hard under these conditions and often less effective than expected, rendering the exposures to those risks much higher (basis risk). Through the losses and downgrading of the monoline insurance companies, the issue of indirect counterparty risk suddenly attracted much more attention, again, as hedges proved ineffective. Given the generally declining markets the number of litigation cases rose strongly. In addition institutions faced with, for instance, rogue trades found it much harder to close those positions without incurring severe losses.

2. Examples of inter-risk concentration

Credit-liquidity risk: Failure of material counterparties impairs an institution's cash flow and its ability to meet commitments.

Credit-market risk: Appears where counterparties are closely related, or the same or where unsystematic or undiversifiable risk is in question. For example, the part of the market risk which derives not from general price movements but from specific ones due to changes in the

perception of the inherent credit risk of an issuer. Furthermore, the worsening credit quality of an issuer can be the source of inter-risk concentration between market risk and credit risk. This, for example, would be the case where a financial institution has given a loan or granted a credit facility in addition to investing in the equity of the same company. All these positions of cash, non-cash loans and stock investments will be adversely affected by deterioration of the credit quality. Therefore, the different types of risks cannot be measured independently and these risks cannot be seen as uncorrelated. This confirms the necessity for the adequate management of inter-risk concentrations.

Credit-operational risk: Exposure to credit risk may be related to potential operational risk drivers, or the credit quality of risk mitigating institutions such as insurance companies may affect the level of operational risk buffers.

Market-liquidity risk: Interruptions in market or financial institutions, increased volatility, rapid changes in value or the drying up of markets for certain instruments may negatively affect the liquidity of a given institution.

3. Market risk concentration and inter-risk concentration arising from the issuer's credit quality as a risk factor

Credit quality of the issuer is one of the single risk factors affecting different types of risks and causing market risk concentration. Deterioration of an issuer's creditworthiness has a negative impact on its share price as well as on the prices of its bonds and it influences the prices of corresponding derivatives. The equity trading desk of a financial institution could have both equity, the fixed-income desk bonds and the derivatives desk could have sold credit protection on the same issuer. Since the prices of all instruments are dependent on the same risk driver, the correlations between different instrument types are very high. This risk concentration shall be taken into account because otherwise the risk situation would not be reflected correctly.

4. Market risk concentration and inter-risk concentration based on the risk aversion of market participants

Another cause of a market risk concentration is a change in the risk preference of market participants. Greater uncertainty about the economic outlook could lead to reluctance to buy risky positions. Risk premiums on all risky products will rise and their prices will fall. This increases the correlations between different asset classes. Some markets will possibly even dry up completely because different asset participants are no longer willing to buy those products. A financial institution, although holding a diversified portfolio, will suffer losses on all types of instruments. This risk concentration caused by a change in the risk premium and the accompanying change in correlations shall be taken into account adequately in the risk management systems of financial institutions.

The rise in the risk premium could also be the source of an inter-risk concentration between market risk and liquidity. A financial institution can generate less liquidity by selling assets because of the lower prices. It is possible that some assets cannot be sold at acceptable prices if

the markets are illiquid as a consequence of market participants' risk aversion. In addition the issuance of debt or equity is more expensive because the financial institution has to pay a higher risk premium itself. Here again the connection between different risk types demands appropriate management of risk concentrations.

5. Inter-risk concentration between market risk and credit risk based on the FX rate

Lending in foreign currency to domestic borrowers is exposed to both market (FX rate) and credit risk. When the domestic currency depreciates, the value of the loan in domestic currency increases which may reduce the ability of borrowers to repay. This effect becomes fairly non-linear at higher depreciation rates.

6. Examples of inter-relationships between liquidity and other risk factors

The bank's overall exposure to other risks and their possible influence on the level of liquidity risk shall be analyzed in conjunction with the bank's funding profile.

Interrelationships between liquidity risk and other risks driven by the same factors can occur especially in times of stressed market conditions. Such dependencies may strengthen the effect of concentrations that exists in liquidity risk. Examples of such interrelationships may comprise:

* Own-credit - liquidity risk: Deterioration in market prices or a downgrade of a counterparty could trigger a margin call or lead to the obligation to deliver additional collateral.

* Reputational - liquidity risk: reputational difficulties may lead to a loss of trust in the institution on the part of counterparties and as a consequence to a reduction in funds available to the institution as well as to the withdrawal of funds.

* Reputational - liquidity risk: In order to maintain a good reputation and to avoid adverse market perceptions, banks may wish to provide funding support to associated parties, even if not contractually obliged to, which leads to a deterioration in their liquidity position.

* Operational risk - liquidity risk: Interruptions in the payment or settlement processes may result in liquidity problems.

* Legal risk - liquidity risk: Potential errors or inaccuracies existing in legal arrangements may make it impossible to enforce the fulfillment of counterparty contracts to provide financing. It may particularly threaten the liquidity of a bank if shortcomings exist in arrangements regarding contingency financing for times of market stress.

ANNEX 2. EXAMPLES OF INDICATORS USED FOR CONCENTRATION RISK MANAGEMENT

Where applicable, concentration indicators should be based upon a risk sensitive measure such as internal capital, risk-weighted assets or expected loss.

* Indicators commonly related to a relevant numeraire such as balance sheet size, own funds, net profit:

    - Total size of a certain number of receivables (e.g. largest ten receivables)

    - Total size of a certain number of connected receivables,

    - Size of significant sectoral/geographic concentrations,

    - Receivable belonging to a specific financial product.

* Diversity scores such as Herfindahl Hirschmann index (HHI), Simpson's equitability index, Shannon-Wiener index, Berger-Parker index, Pilou's evenness index, Moody's diversity scores, etc.

* Concentration curves,

* Gini coefficients,

* Portfolio correlations, and

* Variance/Covariance.