Principles for the Management of Credit Risk

I. Introduction

1. While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management, or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties. This experience is common in both G-10 and non-G-10 countries.

2. Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximise a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organisation.

3. For most banks, loans are the largest and most obvious source of credit risk; however, other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet. Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions.

4. Since exposure to credit risk continues to be the leading source of problems in banks world-wide, banks and their supervisors should be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred. The Basel Committee is issuing this document in order to encourage banking supervisors globally to promote sound practices for managing credit risk. Although the principles contained in this paper are most

clearly applicable to the business of lending, they should be applied to all activities where credit risk is present.

5. The sound practices set out in this document specifically address the following areas: (i) establishing an appropriate credit risk environment; (ii) operating under a sound credit-granting process; (iii) maintaining an appropriate credit administration, measurement and monitoring process; and (iv) ensuring adequate controls over credit risk. Although specific credit risk management practices may differ among banks depending upon the nature and complexity of their credit activities, a comprehensive credit risk management program will address these four areas. These practices should also be applied in conjunction with sound practices related to the assessment of asset quality, the adequacy of provisions and reserves, and the disclosure of credit risk, all of which have been addressed in other recent Basel Committee documents.[1]

6. While the exact approach chosen by individual supervisors will depend on a host of factors, including their on-site and off-site supervisory techniques and the degree to which external auditors are also used in the supervisory function, **all members of the Basel Committee agree that the principles set out in this paper should be used in evaluating a bank's credit risk management system**. Supervisory expectations for the credit risk management approach used by individual banks should be commensurate with the scope and sophistication of the bank's activities. For smaller or less sophisticated banks, supervisors need to determine that the credit risk management approach used is sufficient for their activities and that they have instilled sufficient risk-return discipline in their credit risk management processes. The Committee stipulates in Sections II to VI of the paper, principles for banking supervisory authorities to apply in assessing bank's credit risk management systems. In addition, the appendix provides an overview of credit problems commonly seen by supervisors.

7. A further particular instance of credit risk relates to the process of settling financial transactions. If one side of a transaction is settled but the other fails, a loss may be incurred that is equal to the principal amount of the transaction. Even if one party is simply late in settling, then the other party may incur a loss relating to missed investment opportunities. Settlement risk (i.e. the risk that the completion or settlement of a financial transaction will fail to take place as expected) thus includes elements of liquidity, market, operational and

[1] See in particular *Sound Practices for Loan Accounting and Disclosure* (July 1999) and *Best Practices for Credit Risk Disclosure* (September 2000).

reputational risk as well as credit risk. The level of risk is determined by the particular arrangements for settlement. Factors in such arrangements that have a bearing on credit risk include: the timing of the exchange of value; payment/settlement finality; and the role of intermediaries and clearing houses.[2]

8. This paper was originally published for consultation in July 1999. The Committee is grateful to the central banks, supervisory authorities, banking associations, and institutions that provided comments. These comments have informed the production of this final version of the paper.

[2] See in particular *Supervisory Guidance for Managing Settlement Risk in Foreign Exchange Transactions* (September 2000), in which the annotated bibliography (annex 3) provides a list of publications related to various settlement risks.

Principles for the Assessment of Banks' Management of Credit Risk

A. Establishing an appropriate credit risk environment

Principle 1: The board of directors should have responsibility for approving and periodically (at least annually) reviewing the credit risk strategy and significant credit risk policies of the bank. The strategy should reflect the bank's tolerance for risk and the level of profitability the bank expects to achieve for incurring various credit risks.

Principle 2: Senior management should have responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities and at both the individual credit and portfolio levels.

Principle 3: Banks should identify and manage credit risk inherent in all products and activities. Banks should ensure that the risks of products and activities new to them are subject to adequate risk management procedures and controls before being introduced or undertaken, and approved in advance by the board of directors or its appropriate committee.

B. Operating under a sound credit granting process

Principle 4: Banks must operate within sound, well-defined credit-granting criteria. These criteria should include a clear indication of the bank's target market and a thorough understanding of the borrower or counterparty, as well as the purpose and structure of the credit, and its source of repayment.

Principle 5: Banks should establish overall credit limits at the level of individual borrowers and counterparties, and groups of connected counterparties that aggregate in a comparable and meaningful manner different types of exposures, both in the banking and trading book and on and off the balance sheet.

Principle 6: Banks should have a clearly-established process in place for approving new credits as well as the amendment, renewal and re-financing of existing credits.

Principle 7: All extensions of credit must be made on an arm's-length basis. In particular, credits to related companies and individuals must be authorised on an exception basis, monitored with particular care and other appropriate steps taken to control or mitigate the risks of non-arm's length lending.

C. Maintaining an appropriate credit administration, measurement and monitoring process

Principle 8: Banks should have in place a system for the ongoing administration of their various credit risk-bearing portfolios.

Principle 9: Banks must have in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.

Principle 10: Banks are encouraged to develop and utilise an internal risk rating system in managing credit risk. The rating system should be consistent with the nature, size and complexity of a bank's activities.

Principle 11: Banks must have information systems and analytical techniques that enable management to measure the credit risk inherent in all on- and off-balance sheet activities. The management information system should provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk.

Principle 12: Banks must have in place a system for monitoring the overall composition and quality of the credit portfolio.

Principle 13: Banks should take into consideration potential future changes in economic conditions when assessing individual credits and their credit portfolios, and should assess their credit risk exposures under stressful conditions.

D. Ensuring adequate controls over credit risk

Principle 14: Banks must establish a system of independent, ongoing assessment of the bank's credit risk management processes and the results of such reviews should be communicated directly to the board of directors and senior management.

Principle 15: Banks must ensure that the credit-granting function is being properly managed and that credit exposures are within levels consistent with prudential standards and internal limits. Banks should establish and enforce internal controls and other practices to ensure that exceptions to policies, procedures and limits are reported in a timely manner to the appropriate level of management for action.

Principle 16: Banks must have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.

E. The role of supervisors

Principle 17: Supervisors should require that banks have an effective system in place to identify, measure, monitor and control credit risk as part of an overall approach to risk management. Supervisors should conduct an independent evaluation of a bank's strategies, policies, procedures and practices related to the granting of credit and the ongoing management of the portfolio. Supervisors should consider setting prudential limits to restrict bank exposures to single borrowers or groups of connected counterparties.

II. Establishing an Appropriate Credit Risk Environment

Principle 1: The board of directors should have responsibility for approving and periodically (at least annually) reviewing the credit risk strategy and significant credit risk policies of the bank. The strategy should reflect the bank's tolerance for risk and the level of profitability the bank expects to achieve for incurring various credit risks.

9. As with all other areas of a bank's activities, the board of directors[3] has a critical role to play in overseeing the credit-granting and credit risk management functions of the bank.

[3] This paper refers to a management structure composed of a board of directors and senior management. The Committee is aware that there are significant differences in legislative and regulatory frameworks across countries as regards the functions of the board of directors and senior management. In some countries, the board has the main, if not exclusive, function of supervising the executive body (senior management, general management) so as to ensure that the latter fulfils its tasks. For this reason, in some cases, it is known as a supervisory board. This means that the board has no executive functions. In other countries, by contrast, the board has a broader competence in that it lays down the general framework for the management of the bank. Owing to these differences, the notions of the board of directors and senior management are used in this paper not to identify legal constructs but rather to label two decision-making functions within a bank.

Each bank should develop a credit risk strategy or plan that establishes the objectives guiding the bank's credit-granting activities and adopt the necessary policies and procedures for conducting such activities. The credit risk strategy, as well as significant credit risk policies, should be approved and periodically (at least annually) reviewed by the board of directors. The board needs to recognise that the strategy and policies must cover the many activities of the bank in which credit exposure is a significant risk.

10. The strategy should include a statement of the bank's willingness to grant credit based on exposure type (for example, commercial, consumer, real estate), economic sector, geographical location, currency, maturity and anticipated profitability. This might also include the identification of target markets and the overall characteristics that the bank would want to achieve in its credit portfolio (including levels of diversification and concentration tolerances).

11. The credit risk strategy should give recognition to the goals of credit quality, earnings and growth. Every bank, regardless of size, is in business to be profitable and, consequently, must determine the acceptable risk/reward trade-off for its activities, factoring in the cost of capital. A bank's board of directors should approve the bank's strategy for selecting risks and maximising profits. The board should periodically review the financial results of the bank and, based on these results, determine if changes need to be made to the strategy. The board must also determine that the bank's capital level is adequate for the risks assumed throughout the entire organisation.

12. The credit risk strategy of any bank should provide continuity in approach. Therefore, the strategy will need to take into account the cyclical aspects of any economy and the resulting shifts in the composition and quality of the overall credit portfolio. Although the strategy should be periodically assessed and amended, it should be viable in the long-run and through various economic cycles.

13. The credit risk strategy and policies should be effectively communicated throughout the banking organisation. All relevant personnel should clearly understand the bank's approach to granting and managing credit and should be held accountable for complying with established policies and procedures.

14. The board should ensure that senior management is fully capable of managing the credit activities conducted by the bank and that such activities are done within the risk strategy, policies and tolerances approved by the board. The board should also regularly (i.e. at least annually), either within the credit risk strategy or within a statement of credit policy, approve the bank's overall credit granting criteria (including general terms and conditions). In

addition, it should approve the manner in which the bank will organise its credit-granting functions, including independent review of the credit granting and management function and the overall portfolio.

15. While members of the board of directors, particularly outside directors, can be important sources of new business for the bank, once a potential credit is introduced, the bank's established processes should determine how much and at what terms credit is granted. In order to avoid conflicts of interest, it is important that board members not override the credit-granting and monitoring processes of the bank.

16. The board of directors should ensure that the bank's remuneration policies do not contradict its credit risk strategy. Remuneration policies that reward unacceptable behaviour such as generating short-term profits while deviating from credit policies or exceeding established limits, weaken the bank's credit processes.

Principle 2: Senior management should have responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities and at both the individual credit and portfolio levels.

17. Senior management of a bank is responsible for implementing the credit risk strategy approved by the board of directors. This includes ensuring that the bank's credit-granting activities conform to the established strategy, that written procedures are developed and implemented, and that loan approval and review responsibilities are clearly and properly assigned. Senior management must also ensure that there is a periodic independent internal assessment of the bank's credit-granting and management functions.[4]

18. A cornerstone of safe and sound banking is the design and implementation of written policies and procedures related to identifying, measuring, monitoring and controlling credit risk. Credit policies establish the framework for lending and guide the credit-granting activities of the bank. Credit policies should address such topics as target markets, portfolio mix, price and non-price terms, the structure of limits, approval authorities, exception procesing/reporting, etc. Such policies should be clearly defined, consistent with prudent banking practices and relevant regulatory requirements, and adequate for the nature and

[4] This may be difficult for very small banks; however, there should be adequate checks and balances in place to promote sound credit decisions.

complexity of the bank's activities. The policies should be designed and implemented within the context of internal and external factors such as the bank's market position, trade area, staff capabilities and technology. Policies and procedures that are properly developed and implemented enable the bank to: (i) maintain sound credit-granting standards; (ii) monitor and control credit risk; (iii) properly evaluate new business opportunities; and (iv) identify and administer problem credits.

19. As discussed further in paragraphs 30 and 37 through 41 below, banks should develop and implement policies and procedures to ensure that the credit portfolio is adequately diversified given the bank's target markets and overall credit strategy. In particular, such policies should establish targets for portfolio mix as well as set exposure limits on single counterparties and groups of connected counterparties, particular industries or economic sectors, geographic regions and specific products. Banks should ensure that their own internal exposure limits comply with any prudential limits or restrictions set by the banking supervisors.

20. In order to be effective, credit policies must be communicated throughout the organisation, implemented through appropriate procedures, monitored and periodically revised to take into account changing internal and external circumstances. They should be applied, where appropriate, on a consolidated bank basis and at the level of individual affiliates. In addition, the policies should address equally the important functions of reviewing credits on an individual basis and ensuring appropriate diversification at the portfolio level.

21. When banks engage in granting credit internationally, they undertake, in addition to standard credit risk, risk associated with conditions in the home country of a foreign borrower or counterparty. Country or sovereign risk encompasses the entire spectrum of risks arising from the economic, political and social environments of a foreign country that may have potential consequences for foreigners' debt and equity investments in that country. Transfer risk focuses more specifically on a borrower's capacity to obtain the foreign exchange necessary to service its cross-border debt and other contractual obligations. In all instances of international transactions, banks need to understand the globalisation of financial markets and the potential for spillover effects from one country to another or contagion effects for an entire region.

22. Banks that engage in granting credit internationally must therefore have adequate policies and procedures for identifying, measuring, monitoring and controlling country risk and transfer risk in their international lending and investment activities. The monitoring of country risk factors should incorporate (i) the potential default of foreign private sector

counterparties arising from country-specific economic factors and (ii) the enforceability of loan agreements and the timing and ability to realise collateral under the national legal framework. This function is often the responsibility of a specialist team familiar with the particular issues.

Principle 3: Banks should identify and manage credit risk inherent in all products and activities. Banks should ensure that the risks of products and activities new to them are subject to adequate risk management procedures and controls before being introduced or undertaken, and approved in advance by the board of directors or its appropriate committee.

23. The basis for an effective credit risk management process is the identification and analysis of existing and potential risks inherent in any product or activity. Consequently, it is important that banks identify all credit risk inherent in the products they offer and the activities in which they engage. Such identification stems from a careful review of the existing and potential credit risk characteristics of the product or activity.

24. Banks must develop a clear understanding of the credit risks involved in more complex credit-granting activities (for example, loans to certain industry sectors, asset securitisation, customer-written options, credit derivatives, credit-linked notes). This is particularly important because the credit risk involved, while not new to banking, may be less obvious and require more analysis than the risk of more traditional credit-granting activities. Although more complex credit-granting activities may require tailored procedures and controls, the basic principles of credit risk management will still apply.

25. New ventures require significant planning and careful oversight to ensure the risks are appropriately identified and managed. Banks should ensure that the risks of new products and activities are subject to adequate procedures and controls before being introduced or undertaken. Any major new activity should be approved in advance by the board of directors or its appropriate delegated committee.

26. It is critical that senior management determine that the staff involved in any activity where there is borrower or counterparty credit risk, whether established or new, basic or more complex, be fully capable of conducting the activity to the highest standards and in compliance with the bank’s policies and procedures.

III. Operating under a Sound Credit Granting Process

Principle 4: Banks must operate within sound, well-defined credit-granting criteria. These criteria should include a clear indication of the bank's target market and a thorough understanding of the borrower or counterparty, as well as the purpose and structure of the credit, and its source of repayment.

27. Establishing sound, well-defined credit-granting criteria is essential to approving credit in a safe and sound manner. The criteria should set out who is eligible for credit and for how much, what types of credit are available, and under what terms and conditions the credits should be granted.

28. Banks must receive sufficient information to enable a comprehensive assessment of the true risk profile of the borrower or counterparty. Depending on the type of credit exposure and the nature of the credit relationship to date, the factors to be considered and documented in approving credits include:

- the purpose of the credit and sources of repayment;
- the current risk profile (including the nature and aggregate amounts of risks) of the borrower or counterparty and collateral and its sensitivity to economic and market developments;
- the borrower's repayment history and current capacity to repay, based on historical financial trends and future cash flow projections, under various scenarios;
- for commercial credits, the borrower's business expertise and the status of the borrower's economic sector and its position within that sector;
- the proposed terms and conditions of the credit, including covenants designed to limit changes in the future risk profile of the borrower; and
- where applicable, the adequacy and enforceability of collateral or guarantees, including under various scenarios.

In addition, in approving borrowers or counterparties for the first time, consideration should be given to the integrity and reputation of the borrower or counterparty as well as their legal capacity to assume the liability. Once credit-granting criteria have been established, it is essential for the bank to ensure that the information it receives is sufficient to make proper credit-granting decisions. This information will also serve as the basis for rating the credit under the bank's internal rating system.

29. Banks need to understand to whom they are granting credit. Therefore, prior to entering into any new credit relationship, a bank must become familiar with the borrower or counterparty and be confident that they are dealing with an individual or organisation of sound repute and creditworthiness. In particular, strict policies must be in place to avoid association with individuals involved in fraudulent activities and other crimes. This can be achieved through a number of ways, including asking for references from known parties, accessing credit registries, and becoming familiar with individuals responsible for managing a company and checking their personal references and financial condition. However, a bank should not grant credit simply because the borrower or counterparty is familiar to the bank or is perceived to be highly reputable.

30. Banks should have procedures to identify situations where, in considering credits, it is appropriate to classify a group of obligors as connected counterparties and, thus, as a single obligor. This would include aggregating exposures to groups of accounts exhibiting financial interdependence, including corporate or non-corporate, where they are under common ownership or control or with strong connecting links (for example, common management, familial ties).[5] Banks should also have procedures for aggregating exposures to individual clients across business activities.

31. Many banks participate in loan syndications or other such loan consortia. Some institutions place undue reliance on the credit risk analysis done by the lead underwriter or on external commercial loan credit ratings. All syndicate participants should perform their own due diligence, including independent credit risk analysis and review of syndicate terms prior to committing to the syndication. Each bank should analyse the risk and return on syndicated loans in the same manner as directly sourced loans.

32. Granting credit involves accepting risks as well as producing profits. Banks should assess the risk/reward relationship in any credit as well as the overall profitability of the account relationship. In evaluating whether, and on what terms, to grant credit, banks need to assess the risks against expected return, factoring in, to the greatest extent possible, price and non-price (e.g. collateral, restrictive covenants, etc.) terms. In evaluating risk, banks should also assess likely downside scenarios and their possible impact on borrowers or counterparties. A common problem among banks is the tendency not to price a credit or

5 Connected counterparties may be a group of companies related financially or by common ownership, management, research and development, marketing or any combination thereof. Identification of connected counterparties requires a careful analysis of the impact of these factors on the financial interdependency of the parties involved.

overall relationship properly and therefore not receive adequate compensation for the risks incurred.

33. In considering potential credits, banks must recognise the necessity of establishing provisions for identified and expected losses and holding adequate capital to absorb unexpected losses. The bank should factor these considerations into credit-granting decisions, as well as into the overall portfolio risk management process.[6]

34. Banks can utilise transaction structure, collateral and guarantees to help mitigate risks (both identified and inherent) in individual credits but transactions should be entered into primarily on the strength of the borrower's repayment capacity. Collateral cannot be a substitute for a comprehensive assessment of the borrower or counterparty, nor can it compensate for insufficient information. It should be recognised that any credit enforcement actions (e.g. foreclosure proceedings) can eliminate the profit margin on the transaction. In addition, banks need to be mindful that the value of collateral may well be impaired by the same factors that have led to the diminished recoverability of the credit. Banks should have policies covering the acceptability of various forms of collateral, procedures for the ongoing valuation of such collateral, and a process to ensure that collateral is, and continues to be, enforceable and realisable. With regard to guarantees, banks should evaluate the level of coverage being provided in relation to the credit-quality and legal capacity of the guarantor. Banks should be careful when making assumptions about implied support from third parties such as the government.

35. Netting agreements are an important way to reduce credit risks, especially in interbank transactions. In order to actually reduce risk, such agreements need to be sound and legally enforceable.[7]

36. Where actual or potential conflicts of interest exist within the bank, internal confidentiality arrangements (e.g. "Chinese walls") should be established to ensure that there is no hindrance to the bank obtaining all relevant information from the borrower.

Principle 5: Banks should establish overall credit limits at the level of individual borrowers and counterparties, and groups of connected counterparties that aggregate in

[6] Guidance on loan classification and provisioning is available in the document *Sound Practices for Loan Accounting and Disclosure* (July 1999).

[7] Guidance on netting arrangements is available in the document *Consultative paper on on-balance sheet netting* (April 1998).

a comparable and meaningful manner different types of exposures, both in the banking and trading book and on and off the balance sheet.

37. An important element of credit risk management is the establishment of exposure limits on single counterparties and groups of connected counterparties. Such limits are frequently based in part on the internal risk rating assigned to the borrower or counterparty, with counterparties assigned better risk ratings having potentially higher exposure limits. Limits should also be established for particular industries or economic sectors, geographic regions and specific products.

38. Exposure limits are needed in all areas of the bank's activities that involve credit risk. These limits help to ensure that the bank's credit-granting activities are adequately diversified. As mentioned earlier, much of the credit exposure faced by some banks comes from activities and instruments in the trading book and off the balance sheet. Limits on such transactions are particularly effective in managing the overall credit risk profile or counterparty risk of a bank. In order to be effective, limits should generally be binding and not driven by customer demand.

39. Effective measures of potential future exposure are essential for the establishment of meaningful limits, placing an upper bound on the overall scale of activity with, and exposure to, a given counterparty, based on a comparable measure of exposure across a bank's various activities (both on and off-balance-sheet).

40. Banks should consider the results of stress testing in the overall limit setting and monitoring process. Such stress testing should take into consideration economic cycles, interest rate and other market movements, and liquidity conditions.

41. Bank's credit limits should recognise and reflect the risks associated with the near-term liquidation of positions in the event of counterparty default.[8] Where a bank has several transactions with a counterparty, its potential exposure to that counterparty is likely to vary significantly and discontinuously over the maturity over which it is calculated. Potential future exposures should therefore be calculated over multiple time horizons. Limits should also factor in any unsecured exposure in a liquidation scenario.

Principle 6: Banks should have a clearly-established process in place for approving new credits as well as the amendment, renewal and re-financing of existing credits.

[8] Guidance is available in the documents *Banks' Interactions with Highly Leveraged Institutions* and *Sound Practices for Banks' Interactions with Highly Leveraged Institutions* (January 1999).

42. Many individuals within a bank are involved in the credit-granting process. These include individuals from the business origination function, the credit analysis function and the credit approval function. In addition, the same counterparty may be approaching several different areas of the bank for various forms of credit. Banks may choose to assign responsibilities in different ways; however, it is important that the credit granting process coordinate the efforts of all of the various individuals in order to ensure that sound credit decisions are made.

43. In order to maintain a sound credit portfolio, a bank must have an established formal transaction evaluation and approval process for the granting of credits. Approvals should be made in accordance with the bank's written guidelines and granted by the appropriate level of management. There should be a clear audit trail documenting that the approval process was complied with and identifying the individual(s) and/or committee(s) providing input as well as making the credit decision. Banks often benefit from the establishment of specialist credit groups to analyse and approve credits related to significant product lines, types of credit facilities and industrial and geographic sectors. Banks should invest in adequate credit decision resources so that they are able to make sound credit decisions consistent with their credit strategy and meet competitive time, pricing and structuring pressures.

44. Each credit proposal should be subject to careful analysis by a qualified credit analyst with expertise commensurate with the size and complexity of the transaction. An effective evaluation process establishes minimum requirements for the information on which the analysis is to be based. There should be policies in place regarding the information and documentation needed to approve new credits, renew existing credits and/or change the terms and conditions of previously approved credits. The information received will be the basis for any internal evaluation or rating assigned to the credit and its accuracy and adequacy is critical to management making appropriate judgements about the acceptability of the credit.

45. Banks must develop a corps of credit risk officers who have the experience, knowledge and background to exercise prudent judgement in assessing, approving and managing credit risks. A bank's credit-granting approval process should establish accountability for decisions taken and designate who has the absolute authority to approve credits or changes in credit terms. Banks typically utilise a combination of individual signature authority, dual or joint authorities, and a credit approval group or committee, depending upon the size and nature of the credit. Approval authorities should be commensurate with the expertise of the individuals involved.

Principle 7: All extensions of credit must be made on an arm's-length basis. In particular, credits to related companies and individuals must be authorised on an exception basis, monitored with particular care and other appropriate steps taken to control or mitigate the risks of non-arm's length lending.

46. Extensions of credit should be made subject to the criteria and processes described above. These create a system of checks and balances that promote sound credit decisions. Therefore, directors, senior management and other influential parties (e.g. shareholders) should not seek to override the established credit-granting and monitoring processes of the bank.

47. A potential area of abuse arises from granting credit to non-arms-length and related parties, whether companies or individuals.[9] Consequently, it is important that banks grant credit to such parties on an arm's-length basis and that the amount of credit granted is suitably monitored. Such controls are most easily implemented by requiring that the terms and conditions of such credits not be more favourable than credit granted to non-related borrowers under similar circumstances and by imposing strict absolute limits on such credits. Another possible method of control is the public disclosure of the terms of credits granted to related parties. The bank's credit-granting criteria should not be altered to accommodate related companies and individuals.

48. Material transactions with related parties should be subject to the approval of the board of directors (excluding board members with conflicts of interest), and in certain circumstances (e.g. a large loan to a major shareholder) reported to the banking supervisory authorities.

IV. Maintaining an Appropriate Credit Administration, Measurement and Monitoring Process

Principle 8: Banks should have in place a system for the ongoing administration of their various credit risk-bearing portfolios.

[9] Related parties can include the bank's subsidiaries and affiliates, its major shareholders, directors and senior management, and their direct and related interests, as well as any party that the bank exerts control over or that exerts control over the bank.

49. Credit administration is a critical element in maintaining the safety and soundness of a bank. Once a credit is granted, it is the responsibility of the business unit, often in conjunction with a credit administration support team, to ensure that the credit is properly maintained. This includes keeping the credit file up to date, obtaining current financial information, sending out renewal notices and preparing various documents such as loan agreements.

50. Given the wide range of responsibilities of the credit administration function, its organisational structure varies with the size and sophistication of the bank. In larger banks, responsibilities for the various components of credit administration are usually assigned to different departments. In smaller banks, a few individuals might handle several of the functional areas. Where individuals perform such sensitive functions as custody of key documents, wiring out funds, or entering limits into the computer database, they should report to managers who are independent of the business origination and credit approval processes.

51. In developing their credit administration areas, banks should ensure:

- the efficiency and effectiveness of credit administration operations, including monitoring documentation, contractual requirements, legal covenants, collateral, etc.;
- the accuracy and timeliness of information provided to management information systems;
- adequate segregation of duties;
- the adequacy of controls over all "back office" procedures; and
- compliance with prescribed management policies and procedures as well as applicable laws and regulations.

52. For the various components of credit administration to function appropriately, senior management must understand and demonstrate that it recognises the importance of this element of monitoring and controlling credit risk.

53. The credit files should include all of the information necessary to ascertain the current financial condition of the borrower or counterparty as well as sufficient information to track the decisions made and the history of the credit. For example, the credit files should include current financial statements, financial analyses and internal rating documentation, internal memoranda, reference letters, and appraisals. The loan review function should determine that the credit files are complete and that all loan approvals and other necessary documents have been obtained.

Principle 9: Banks must have in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.

54. Banks need to develop and implement comprehensive procedures and information systems to monitor the condition of individual credits and single obligors across the bank's various portfolios. These procedures need to define criteria for identifying and reporting potential problem credits and other transactions to ensure that they are subject to more frequent monitoring as well as possible corrective action, classification and/or provisioning.[10]

55. An effective credit monitoring system will include measures to:

- ensure that the bank understands the current financial condition of the borrower or counterparty;
- monitor compliance with existing covenants;
- assess, where applicable, collateral coverage relative to the obligor's current condition;
- identify contractual payment delinquencies and classify potential problem credits on a timely basis; and
- direct promptly problems for remedial management.

56. Specific individuals should be responsible for monitoring credit quality, including ensuring that relevant information is passed to those responsible for assigning internal risk ratings to the credit. In addition, individuals should be made responsible for monitoring on an ongoing basis any underlying collateral and guarantees. Such monitoring will assist the bank in making necessary changes to contractual arrangements as well as maintaining adequate reserves for credit losses. In assigning these responsibilities, bank management should recognise the potential for conflicts of interest, especially for personnel who are judged and rewarded on such indicators as loan volume, portfolio quality or short-term profitability.

Principle 10: Banks are encouraged to develop and utilise an internal risk rating system in managing credit risk. The rating system should be consistent with the nature, size and complexity of a bank's activities.

57. An important tool in monitoring the quality of individual credits, as well as the total portfolio, is the use of an internal risk rating system. A well-structured internal risk rating system is a good means of differentiating the degree of credit risk in the different credit

[10] See footnote 6.

exposures of a bank. This will allow more accurate determination of the overall characteristics of the credit portfolio, concentrations, problem credits, and the adequacy of loan loss reserves. More detailed and sophisticated internal risk rating systems, used primarily at larger banks, can also be used to determine internal capital allocation, pricing of credits, and profitability of transactions and relationships.

58. Typically, an internal risk rating system categorises credits into various classes designed to take into account gradations in risk. Simpler systems might be based on several categories ranging from satisfactory to unsatisfactory; however, more meaningful systems will have numerous gradations for credits considered satisfactory in order to truly differentiate the relative credit risk they pose. In developing their systems, banks must decide whether to rate the riskiness of the borrower or counterparty, the risks associated with a specific transaction, or both.

59. Internal risk ratings are an important tool in monitoring and controlling credit risk. In order to facilitate early identification of changes in risk profiles, the bank's internal risk rating system should be responsive to indicators of potential or actual deterioration in credit risk. Credits with deteriorating ratings should be subject to additional oversight and monitoring, for example, through more frequent visits from credit officers and inclusion on a watchlist that is regularly reviewed by senior management. The internal risk ratings can be used by line management in different departments to track the current characteristics of the credit portfolio and help determine necessary changes to the credit strategy of the bank. Consequently, it is important that the board of directors and senior management also receive periodic reports on the condition of the credit portfolios based on such ratings.

60. The ratings assigned to individual borrowers or counterparties at the time the credit is granted must be reviewed on a periodic basis and individual credits should be assigned a new rating when conditions either improve or deteriorate. Because of the importance of ensuring that internal ratings are consistent and accurately reflect the quality of individual credits, responsibility for setting or confirming such ratings should rest with a credit review function independent of that which originated the credit concerned. It is also important that the consistency and accuracy of ratings is examined periodically by a function such as an independent credit review group.

Principle 11: Banks must have information systems and analytical techniques that enable management to measure the credit risk inherent in all on- and off-balance sheet activities. The management information system should provide adequate information on

the composition of the credit portfolio, including identification of any concentrations of risk.

61. Banks should have methodologies that enable them to quantify the risk involved in exposures to individual borrowers or counterparties. Banks should also be able to analyse credit risk at the product and portfolio level in order to identify any particular sensitivities or concentrations. The measurement of credit risk should take account of (i) the specific nature of the credit (loan, derivative, facility, etc.) and its contractual and financial conditions (maturity, reference rate, etc.); (ii) the exposure profile until maturity in relation to potential market movements; (iii) the existence of collateral or guarantees; and (iv) the potential for default based on the internal risk rating. The analysis of credit risk data should be undertaken at an appropriate frequency with the results reviewed against relevant limits. Banks should use measurement techniques that are appropriate to the complexity and level of the risks involved in their activities, based on robust data, and subject to periodic validation.

62. The effectiveness of a bank's credit risk measurement process is highly dependent on the quality of management information systems. The information generated from such systems enables the board and all levels of management to fulfil their respective oversight roles, including determining the adequate level of capital that the bank should be holding. Therefore, the quality, detail and timeliness of information are critical. In particular, information on the composition and quality of the various portfolios, including on a consolidated bank basis, should permit management to assess quickly and accurately the level of credit risk that the bank has incurred through its various activities and determine whether the bank's performance is meeting the credit risk strategy.

63. Banks should monitor actual exposures against established limits. It is important that banks have a management information system in place to ensure that exposures approaching risk limits are brought to the attention of senior management. All exposures should be included in a risk limit measurement system. The bank's information system should be able to aggregate credit exposures to individual borrowers and counterparties and report on exceptions to credit risk limits on a meaningful and timely basis.

64. Banks should have information systems in place that enable management to identify any concentrations of risk within the credit portfolio. The adequacy of scope of information should be reviewed on a periodic basis by business line managers and senior management to ensure that it is sufficient to the complexity of the business. Increasingly, banks are also

designing information systems that permit additional analysis of the credit portfolio, including stress testing.

Principle 12: Banks must have in place a system for monitoring the overall composition and quality of the credit portfolio.

65. Traditionally, banks have focused on oversight of contractual performance of individual credits in managing their overall credit risk. While this focus is important, banks also need to have in place a system for monitoring the overall composition and quality of the various credit portfolios. This system should be consistent with the nature, size and complexity of the bank's portfolios.

66. A continuing source of credit-related problems in banks is concentrations within the credit portfolio. Concentrations of risk can take many forms and can arise whenever a significant number of credits have similar risk characteristics. Concentrations occur when, among other things, a bank’s portfolio contains a high level of direct or indirect credits to (i) a single counterparty, (ii) a group of connected counterparties[11], (iii) a particular industry or economic sector, (iv) a geographic region, (v) an individual foreign country or a group of countries whose economies are strongly interrelated, (vi) a type of credit facility, or (vii) a type of collateral. Concentrations also occur in credits with the same maturity. Concentrations can stem from more complex or subtle linkages among credits in the portfolio. The concentration of risk does not only apply to the granting of loans but to the whole range of banking activities that, by their nature, involve counterparty risk. A high level of concentration exposes the bank to adverse changes in the area in which the credits are concentrated.

67. In many instances, due to a bank’s trade area, geographic location or lack of access to economically diverse borrowers or counterparties, avoiding or reducing concentrations may be extremely difficult. In addition, banks may want to capitalise on their expertise in a particular industry or economic sector. A bank may also determine that it is being adequately compensated for incurring certain concentrations of risk. Consequently, banks should not necessarily forego booking sound credits solely on the basis of concentration. Banks may need to make use of alternatives to reduce or mitigate concentrations. Such measures can include pricing for the additional risk, increased holdings of capital to compensate for the additional risks and making use of loan participations in order to reduce dependency on a

[11] See footnote 5.

particular sector of the economy or group of related borrowers. Banks must be careful not to enter into transactions with borrowers or counterparties they do not know or engage in credit activities they do not fully understand simply for the sake of diversification.

68. Banks have new possibilities to manage credit concentrations and other portfolio issues. These include such mechanisms as loan sales, credit derivatives, securitisation programs and other secondary loan markets. However, mechanisms to deal with portfolio concentration issues involve risks that must also be identified and managed. Consequently, when banks decide to utilise these mechanisms, they need to first have policies and procedures, as well as adequate controls, in place.

Principle 13: Banks should take into consideration potential future changes in economic conditions when assessing individual credits and their credit portfolios, and should assess their credit risk exposures under stressful conditions.

69. An important element of sound credit risk management involves discussing what could potentially go wrong with individual credits and within the various credit portfolios, and factoring this information into the analysis of the adequacy of capital and provisions. This "what if" exercise can reveal previously undetected areas of potential credit risk exposure for the bank. The linkages between different categories of risk that are likely to emerge in times of crisis should be fully understood. In case of adverse circumstances, there may be a substantial correlation of various risks, especially credit and market risk. Scenario analysis and stress testing are useful ways of assessing areas of potential problems.

70. Stress testing should involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a bank's credit exposures and assessing the bank's ability to withstand such changes. Three areas that banks could usefully examine are: (i) economic or industry downturns; (ii) market-risk events; and (iii) liquidity conditions. Stress testing can range from relatively simple alterations in assumptions about one or more financial, structural or economic variables to the use of highly sophisticated financial models. Typically, the latter are used by large, internationally active banks.

71. Whatever the method of stress testing used, the output of the tests should be reviewed periodically by senior management and appropriate action taken in cases where the results exceed agreed tolerances. The output should also be incorporated into the process for assigning and updating policies and limits.

72. The bank should attempt to identify the types of situations, such as economic downturns, both in the whole economy or in particular sectors, higher than expected levels of

delinquencies and defaults, or the combinations of credit and market events, that could produce substantial losses or liquidity problems. Such an analysis should be done on a consolidated bank basis. Stress-test analyses should also include contingency plans regarding actions management might take given certain scenarios. These can include such techniques as hedging against the outcome or reducing the size of the exposure.

V. Ensuring Adequate Controls over Credit Risk

Principle 14: Banks must establish a system of independent, ongoing assessment of the bank's credit risk management processes and the results of such reviews should be communicated directly to the board of directors and senior management.

73. Because various appointed individuals throughout a bank have the authority to grant credit, the bank should have an efficient internal review and reporting system in order to manage effectively the bank's various portfolios. This system should provide the board of directors and senior management with sufficient information to evaluate the performance of account officers and the condition of the credit portfolio.

74. Internal credit reviews conducted by individuals independent from the business function provide an important assessment of individual credits and the overall quality of the credit portfolio. Such a credit review function can help evaluate the overall credit administration process, determine the accuracy of internal risk ratings and judge whether the account officer is properly monitoring individual credits. The credit review function should report directly to the board of directors, a committee with audit responsibilities, or senior management without lending authority (e.g., senior management within the risk control function).

Principle 15: Banks must ensure that the credit-granting function is being properly managed and that credit exposures are within levels consistent with prudential standards and internal limits. Banks should establish and enforce internal controls and other practices to ensure that exceptions to policies, procedures and limits are reported in a timely manner to the appropriate level of management for action.

75. The goal of credit risk management is to maintain a bank's credit risk exposure within parameters set by the board of directors and senior management. The establishment and enforcement of internal controls, operating limits and other practices will help ensure that

credit risk exposures do not exceed levels acceptable to the individual bank. Such a system will enable bank management to monitor adherence to the established credit risk objectives.

76. Limit systems should ensure that granting of credit exceeding certain predetermined levels receive prompt management attention. An appropriate limit system should assist management in controlling credit risk exposures, initiating discussion about opportunities and risks, and monitoring actual risk taking against predetermined credit risk tolerances.

77. Internal audits of the credit risk processes should be conducted on a periodic basis to determine that credit activities are in compliance with the bank's credit policies and procedures, that credits are authorised within the guidelines established by the bank's board of directors and that the existence, quality and value of individual credits are accurately being reported to senior management. Such audits should also be used to identify areas of weakness in the credit risk management process, policies and procedures as well as any exceptions to policies, procedures and limits.

Principle 16: Banks must have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.

78. One reason for establishing a systematic credit review process is to identify weakened or problem credits.[12] A reduction in credit quality should be recognised at an early stage when there may be more options available for improving the credit. Banks must have a disciplined and vigorous remedial management process, triggered by specific events, that is administered through the credit administration and problem recognition systems.

79. A bank's credit risk policies should clearly set out how the bank will manage problem credits. Banks differ on the methods and organisation they use to manage problem credits. Responsibility for such credits may be assigned to the originating business function, a specialised workout section, or a combination of the two, depending upon the size and nature of the credit and the reason for its problems.

80. Effective workout programs are critical to managing risk in the portfolio. When a bank has significant credit-related problems, it is important to segregate the workout function from the area that originated the credit. The additional resources, expertise and more concentrated focus of a specialised workout section normally improve collection results. A workout section can help develop an effective strategy to rehabilitate a troubled credit or to

[12] See footnote 6.

increase the amount of repayment ultimately collected. An experienced workout section can also provide valuable input into any credit restructurings organised by the business function.

VI. The Role of Supervisors

Principle 17: Supervisors should require that banks have an effective system in place to identify, measure, monitor and control credit risk as part of an overall approach to risk management. Supervisors should conduct an independent evaluation of a bank's strategies, policies, procedures and practices related to the granting of credit and the ongoing management of the portfolio. Supervisors should consider setting prudential limits to restrict bank exposures to single borrowers or groups of connected counterparties.

81. Although the board of directors and senior management bear the ultimate responsibility for an effective system of credit risk management, supervisors should, as part of their ongoing supervisory activities, assess the system in place at individual banks to identify, measure, monitor and control credit risk. This should include an assessment of any measurement tools (such as internal risk ratings and credit risk models) used by the bank. In addition, they should determine that the board of directors effectively oversees the credit risk management process of the bank and that management monitors risk positions, and compliance with and appropriateness of policies.

82. To evaluate the quality of credit risk management systems, supervisors can take a number of approaches. A key element in such an evaluation is the determination by supervisors that the bank is utilising sound asset valuation procedures. Most typically, supervisors, or the external auditors on whose work they partially rely, conduct a review of the quality of a sample of individual credits. In those instances where the supervisory analysis agrees with the internal analysis conducted by the bank, a higher degree of dependence can be placed on the use of such internal reviews for assessing the overall quality of the credit portfolio and the adequacy of provisions and reserves[13]. Supervisors or external auditors should also assess the quality of a bank's own internal validation process where internal risk

[13] The New Capital Adequacy Framework anticipates that, subject to supervisory approval, banks' internal rating methodologies may be used as a basis for regulatory capital calculation. Guidance to supervisors specific to this purpose will be published in due course.

ratings and/or credit risk models are used. Supervisors should also review the results of any independent internal reviews of the credit-granting and credit administration functions. Supervisors should also make use of any reviews conducted by the bank's external auditors, where available.

83. Supervisors should take particular note of whether bank management recognises problem credits at an early stage and takes the appropriate actions.[14] Supervisors should monitor trends within a bank's overall credit portfolio and discuss with senior management any marked deterioration. Supervisors should also assess whether the capital of the bank, in addition to its provisions and reserves, is adequate related to the level of credit risk identified and inherent in the bank's various on- and off-balance sheet activities.

84. In reviewing the adequacy of the credit risk management process, home country supervisors should also determine that the process is effective across business lines, subsidiaries and national boundaries. It is important that supervisors evaluate the credit risk management system not only at the level of individual businesses or legal entities but also across the wide spectrum of activities and subsidiaries within the consolidated banking organisation.

85. After the credit risk management process is evaluated, the supervisors should address with management any weaknesses detected in the system, excess concentrations, the classification of problem credits and the estimation of any additional provisions and the effect on the bank's profitability of any suspension of interest accruals. In those instances where supervisors determine that a bank's overall credit risk management system is not adequate or effective for that bank's specific credit risk profile, they should ensure the bank takes the appropriate actions to improve promptly its credit risk management process.

86. Supervisors should consider setting prudential limits (e.g., large exposure limits) that would apply to all banks, irrespective of the quality of their credit risk management process. Such limits would include restricting bank exposures to single borrowers or groups of connected counterparties. Supervisors may also want to impose certain reporting requirements for credits of a particular type or exceeding certain established levels. In particular, special attention needs to be paid to credits granted to counterparties "connected" to the bank, or to each other.

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[14] See footnote 6.

Appendix

Common Sources of Major Credit Problems

1. Most major banking problems have been either explicitly or indirectly caused by weaknesses in credit risk management. In supervisors' experience, certain key problems tend to recur. Severe credit losses in a banking system usually reflect simultaneous problems in several areas, such as concentrations, failures of due diligence and inadequate monitoring. This appendix summarises some of the most common problems related to the broad areas of concentrations, credit processing, and market- and liquidity-sensitive credit exposures.

Concentrations

2. Concentrations are probably the single most important cause of major credit problems. Credit concentrations are viewed as any exposure where the potential losses are large relative to the bank's capital, its total assets or, where adequate measures exist, the bank's overall risk level. Relatively large losses[15] may reflect not only **large exposures**, but also the potential for **unusually high percentage losses given default**.

3. Credit concentrations can further be grouped roughly into two categories:

- **Conventional credit concentrations** would include concentrations of credits to single borrowers or counterparties, a group of connected counterparties, and sectors or industries, such as commercial real estate, and oil and gas.
- **Concentrations based on common or correlated risk factors** reflect subtler or more situation-specific factors, and often can only be uncovered through analysis. Disturbances in Asia and Russia in late 1998 illustrate how close linkages among emerging markets under stress conditions and previously undetected correlations between market and credit risks, as well as between those risks and liquidity risk, can produce widespread losses.

4. Examples of concentrations based on the potential for unusually deep losses often embody factors such as leverage, optionality, correlation of risk factors and structured financings that concentrate risk in certain tranches. For example, a highly leveraged borrower

[15] Losses are equal to the exposure times the percentage loss given the event of default.

will likely produce larger credit losses for a given severe price or economic shock than a less leveraged borrower whose capital can absorb a significant portion of any loss. The onset of exchange rate devaluations in late 1997 in Asia revealed the correlation between exchange rate devaluation and declines in financial condition of foreign exchange derivative counterparties resident in the devaluing country, producing very substantial losses relative to notional amounts of those derivatives. The risk in a pool of assets can be concentrated in a securitisation into subordinated tranches and claims on leveraged special purpose vehicles, which in a downturn would suffer substantial losses.

5. The recurrent nature of credit concentration problems, especially involving conventional credit concentrations, raises the issue of why banks allow concentrations to develop. First, in developing their business strategy, most banks face an inherent trade-off between choosing to specialise in a few key areas with the goal of achieving a market leadership position and diversifying their income streams, especially when they are engaged in some volatile market segments. This trade-off has been exacerbated by intensified competition among banks and non-banks alike for traditional banking activities, such as providing credit to investment grade corporations. Concentrations appear most frequently to arise because banks identify “hot” and rapidly growing industries and use overly optimistic assumptions about an industry’s future prospects, especially asset appreciation and the potential to earn above-average fees and/or spreads. Banks seem most susceptible to overlooking the dangers in such situations when they are focused on asset growth or market share.

6. Banking supervisors should have specific regulations limiting concentrations to one borrower or set of related borrowers, and, in fact, should also expect banks to set much lower limits on single-obligor exposure. Most credit risk managers in banks also monitor industry concentrations. Many banks are exploring techniques to identify concentrations based on common risk factors or correlations among factors. While small banks may find it difficult not to be at or near limits on concentrations, very large banking organisations must recognise that, because of their large capital base, their exposures to single obligors can reach imprudent levels while remaining within regulatory limits.

Credit Process Issues

7. Many credit problems reveal basic weaknesses in the credit granting and monitoring processes. While shortcomings in underwriting and management of market-related credit

exposures represent important sources of losses at banks, many credit problems would have been avoided or mitigated by a strong internal credit process.

8. Many banks find carrying out **a thorough credit assessment** (or basic due diligence) a substantial challenge. For traditional bank lending, competitive pressures and the growth of loan syndication techniques create time constraints that interfere with basic due diligence. Globalisation of credit markets increases the need for financial information based on sound accounting standards and timely macroeconomic and flow of funds data. When this information is not available or reliable, banks may dispense with financial and economic analysis and support credit decisions with simple indicators of credit quality, especially if they perceive a need to gain a competitive foothold in a rapidly growing foreign market. Finally, banks may need new types of information, such as risk measurements, and more frequent financial information, to assess relatively newer counterparties, such as institutional investors and highly leveraged institutions.

9. The absence of **testing and validation of new lending techniques** is another important problem. Adoption of untested lending techniques in new or innovative areas of the market, especially techniques that dispense with sound principles of due diligence or traditional benchmarks for leverage, have led to serious problems at many banks. Sound practice calls for the application of basic principles to new types of credit activity. Any new technique involves uncertainty about its effectiveness. That uncertainty should be reflected in somewhat greater conservatism and corroborating indicators of credit quality. An example of the problem is the expanded use of credit-scoring models in consumer lending in the United States and some other countries. Large credit losses experienced by some banks for particular tranches of certain mass-marketed products indicates the potential for scoring weaknesses.

10. Some credit problems arise from **subjective decision-making by senior management** of the bank. This includes extending credits to companies they own or with which they are affiliated, to personal friends, to persons with a reputation for financial acumen or to meet a personal agenda, such as cultivating special relationships with celebrities.

11. Many banks that experienced asset quality problems in the 1990s lacked an **effective credit review process** (and indeed, many banks had no credit review function). Credit review at larger banks usually is a department made up of analysts, independent of the lending officers, who make an independent assessment of the quality of a credit or a credit relationship based on documentation such as financial statements, credit analysis provided by the account officer and collateral appraisals. At smaller banks, this function may be more limited and performed by internal or external auditors. The purpose of credit review is to

provide appropriate checks and balances to ensure that credits are made in accordance with bank policy and to provide an independent judgement of asset quality, uninfluenced by relationships with the borrower. Effective credit review not only helps to detect poorly underwritten credits, it also helps prevent weak credits from being granted, since credit officers are likely to be more diligent if they know their work will be subject to review.

12. A common and very important problem among troubled banks in the early 1990s was their failure to **monitor borrowers or collateral values**. Many banks neglected to obtain periodic financial information from borrowers or real estate appraisals in order to evaluate the quality of loans on their books and the adequacy of collateral. As a result, many banks failed to recognise early signs that asset quality was deteriorating and missed opportunities to work with borrowers to stem their financial deterioration and to protect the bank's position. This lack of monitoring led to a costly process by senior management to determine the dimension and severity of the problem loans and resulted in large losses.

13. In some cases, the failure to perform adequate due diligence and financial analysis and to monitor the borrower can result in a breakdown of **controls to detect credit-related fraud**. For example, banks experiencing fraud-related losses have neglected to inspect collateral, such as goods in a warehouse or on a showroom floor, have not authenticated or valued financial assets presented as collateral, or have not required audited financial statements and carefully analysed them. An effective credit review department and independent collateral appraisals are important protective measures, especially to ensure that credit officers and other insiders are not colluding with borrowers.

14. In addition to shortcomings in due diligence and credit analysis, bank credit problems reflect other recurring problems in credit-granting decisions. Some banks analyse credits and decide on appropriate non-price credit terms, but do not use **risk-sensitive pricing**. Banks that lack a sound pricing methodology and the discipline to follow consistently such a methodology will tend to attract a disproportionate share of under-priced risks. These banks will be increasingly disadvantaged relative to banks that have superior pricing skills.

15. Many banks have experienced credit losses because of the failure to use sufficient **caution with certain leveraged credit arrangements**. As noted above, credit extended to highly leveraged borrowers is likely to have large losses in default. Similarly, leveraged structures such as some buyout or debt restructuring strategies, or structures involving customer-written options, generally introduce concentrated credit risks into the bank's credit portfolio and should only be used with financially strong customers. Often, however, such

structures are most appealing to weaker borrowers because the financing enables a substantial upside gain if all goes well, while the borrower's losses are limited to its net worth.

16. Many banks' credit activities involve **lending againstnon-financial assets**. In such lending, many banks have failed to make an adequate assessment of the correlation between the financial condition of the borrower and the price changes and liquidity of the market for the collateral assets. Much asset-based business lending (i.e. commercial finance, equipment leasing, and factoring) and commercial real estate lending appear to involve a relatively high correlation between borrower creditworthiness and asset values. Since the borrower's income, the principal source of repayment, is generally tied to the assets in question, deterioration in the borrower's income stream, if due to industry or regional economic problems, may be accompanied by declines in asset values for the collateral. Some asset based consumer lending (i.e. home equity loans, auto financing) exhibits a similar, if weaker, relationship between the financial health of consumers and the markets for consumer assets.

17. A related problem is that many banks do not take **sufficient account of business cycle effects** in lending. As income prospects and asset values rise in the ascending portion of the business cycle, credit analysis may incorporate overly optimistic assumptions. Industries such as retailing, commercial real estate and real estate investment trusts, utilities, and consumer lending often experience strong cyclical effects. Sometimes the cycle is less related to general business conditions than the product cycle in a relatively new, rapidly growing sector, such as health care and telecommunications. Effective stress testing which takes account of business or product cycle effects is one approach to incorporating into credit decisions a fuller understanding of a borrower's credit risk.

18. More generally, many underwriting problems reflect the absence of a **thoughtful consideration of downside scenarios**. In addition to the business cycle, borrowers may be vulnerable to changes in risk factors such as specific commodity prices, shifts in the competitive landscape and the uncertainty of success in business strategy or management direction. Many lenders fail to "stress test" or analyse the credit using sufficiently adverse assumptions and thus fail to detect vulnerabilities.

Market and Liquidity-Sensitive Credit Exposures

19. Market and liquidity-sensitive exposures pose special challenges to the credit processes at banks. Market-sensitive exposures include foreign exchange and financial derivative contracts. Liquidity-sensitive exposures include margin and collateral agreements with periodic margin calls, liquidity back-up lines, commitments and some letters of credit,

and some unwind provisions of securitisations. The contingent nature of the exposure in these instruments requires the bank to have the ability to assess the probability distribution of the size of actual exposure in the future and its impact on both the borrower's and the bank's leverage and liquidity.

20. An issue faced by virtually all financial institutions is the need to develop **meaningful measures of exposure** that can be compared readily with loans and other credit exposures. This problem is described at some length in the Basel Committee's January 1999 study of exposures to highly leveraged institutions.[16]

21. Market-sensitive instruments require a **careful analysis of the customer's willingness and ability to pay.** Most market-sensitive instruments, such as financial derivatives, are viewed as relatively sophisticated instruments, requiring some effort by both the bank and the customer to ensure that the contract is well understood by the customer. The link to changes in asset prices in financial markets means that the value of such instruments can change very sharply and adversely to the customer, usually with a small, but non-zero probability. Effective stress testing can reveal the potential for large losses, which sound practice suggests should be disclosed to the customer. Banks have suffered significant losses when they have taken insufficient care to ensure that the customer fully understood the transaction at origination and subsequent large adverse price movements left the customer owing the bank a substantial amount.

22. Liquidity-sensitive credit arrangements or instruments require a **careful analysis of the customer's vulnerability to liquidity stresses**, since the bank's funded credit exposure can grow rapidly when customers are subject to such stresses. Such increased pressure to have sufficient liquidity to meet margin agreements supporting over-the-counter trading activities or clearing and settlement arrangements may directly reflect market price volatility. In other instances, liquidity pressures in the financial system may reflect credit concerns and a constricting of normal credit activity, leading borrowers to utilise liquidity backup lines or commitments. Liquidity pressures can also be the result of inadequate liquidity risk management by the customer or a decline in its creditworthiness, making an assessment of a borrower's or counterparty's liquidity risk profile another important element of credit analysis.

[16] See *Banks' Interactions with Highly Leveraged Institutions* and *Sound Practices for Banks' Interactions with Highly Leveraged Institutions* (January 1999).

23. Market- and liquidity-sensitive instruments change in riskiness with changes in the underlying distribution of price changes and market conditions. For market-sensitive instruments, for example, increases in the volatility of price changes effectively increases potential exposures. Consequently, banks should conduct **stress testing of volatility assumptions**.

24. Market- and liquidity-sensitive exposures, because they are probabilistic, can be correlated with the creditworthiness of the borrower. This is an important insight gained from the market turmoil in Asia, Russia and elsewhere in the course of 1997 and 1998. That is, the same factor that changes the value of a market- or liquidity-sensitive instrument can also influence the borrower's financial health and future prospects. Banks need to **analyse the relationship between market- and liquidity-sensitive exposures and the default risk of the borrower**. Stress testing — shocking the market or liquidity factors — is a key element of that analysis.