Sound Practices for the Management of Liquidity Risk at Securities Firms

OICV-IOSCO

Report of the Technical Committee of the International Organization of Securities Commissions

May 2002

Table of Contents

INTRODUCTION 1
Purpose 1
Approach 2
Scope 2
Structure 2
SECTION A: IDENTIFYING LIQUIDITY RISK 2
The definition of liquidity 2
The definition of liquidity risk 3
Sources of liquidity 3
Major sources of liquidity risk 4
Liquidity risks of particular importance to securities firms 4
Reliance on credit-sensitive liquidity sources 4
Contingent commitments 5
Leverage 5
Firms that are part of a universal banking group 6
SECTION B: HIGH-LEVEL MANAGEMENT OF LIQUIDITY RISK 6
Board and Senior Management Responsibilities 7
The role of the board of directors 7
The role of senior management 7
SECTION C: MEASUREMENT OF LIQUIDITY RISK 8
Measurement techniques and other quantitative indicators 8
Target liquidity ratios and other quantitative indicators 8
Mismatched cash flows, foreign exchange and derivatives exposures 9
Value-at-Risk (VaR) 9
Liquidity at Risk (LaR) 10
SECTION D: MONITORING LIQUIDITY RISK 10
Strategies, policies and procedures 10
Management information systems 12
SECTION E: CONTROLLING LIQUIDITY RISK 12
Limit setting 13
Concentration limits and diversification 13
Other limits 13
Scenario testing 14
Contingency Planning and Crisis Management 15
Use of collateral 15
SECTION F: REGULATORY REQUIREMENTS 16
Capital and Reporting Requirements 16
Intra-Group Liquidity Transfers 17
CONCLUSION 17
Commendable practices 17
Areas for improvement 18
Future challenges 19
ANNEX - Survey on Funding and Liquidity Risk Management at Securities Firms

SOUND PRACTICES FOR THE MANAGEMENT OF LIQUIDITY RISK AT SECURITIES FIRMS

INTRODUCTION

1. Market risk and credit risk have been the subject of much industry and regulatory attention. However, major events such as the Asian crisis in 1997, the collapse of the Russian ruble in 1998, the downfall of the hedge fund Long-Term Capital Management in 1998 and the World Trade Center attack in 2001, have shown the possible impacts of liquidity risk and highlighted the necessity for securities firms to consider liquidity as a separate and important risk.

2. Supervisors also recognize the importance of liquidity to the financial system and strive to minimize the impact of liquidity failures on the system as a whole, as demonstrated by the coordinated rescue of LTCM by its private sector counterparties. Similarly, the catastrophic events of September 11, 2001 could have had a serious effect on the global financial system had the U.S. Federal Reserve, and other central banks around the world, not provided ample liquidity to the system, both within the United States and its major trading partners. It is worthwhile to note that, whereas the LTCM crisis was due to a liquidity failure at a single large institution, the situation created by the September 11 attack on the World Trade Center highlighted the ways in which operational risk can impact liquidity.

3. The Technical Committee believes that liquidity is essential to the viability of financial institutions and that risks to the timely and cost-effective supply of liquidity can be disruptive in many ways. It is important, therefore, that securities firms devise and implement appropriate risk management practices and strive to create a risk sensitive culture throughout their organization. Adequate systems and procedures for identifying, measuring, monitoring and controlling liquidity risks can highlight areas of potential concern and enable solutions to be sought before serious problems arise. Firms that are perceived to maintain a strong liquidity position will benefit from increased market confidence resulting in improved funding costs and availability. Further, robust risk management practices at regulated firms reinforce the integrity of the global financial system.

Purpose

4. This paper builds on IOSCO Principles 22 to 24, which set out key elements for the on-going supervision of market intermediaries and it complements other studies undertaken by IOSCO, in particular, "Risk Management and Control Guidance for Securities Firms and their Supervisors." Its purpose is threefold:

- to promote awareness of the need for sound liquidity risk management and related internal controls at securities firms;
- to highlight particularly commendable practices; and
- to identify areas for improvement.

The paper may serve as a reference for securities firms and their supervisors in establishing and reviewing their respective practices.

5. Accordingly, this paper describes prudent practices for the management of liquidity risk observed at a representative selection of major securities firms around the world. The findings from a survey undertaken in 9 jurisdictions globally serve as a basis for this paper and are included in the Annex.

Approach

6. The approach taken is descriptive rather than prescriptive in recognition of the variety of organizational and ownership structures, the nature, scale and complexity of business, and diversity of legal and regulatory requirements observed at regulated securities firms around the world. Indeed, the ownership structure of firms surveyed covered a spectrum of entities, from those that are fully integrated into a universal banking group to independent, stand-alone structures, while the activities ranged from intermediation only to taking on principal risk as dealer or as counterparty to sophisticated transactions, and providing investment banking services. As the survey demonstrated, the sources of liquidity utilized by securities firms depend to a great extent on their ownership structure. Similarly, the sophistication of the processes used to manage liquidity depends on the nature, scale and complexity of their activities. Nevertheless, the core principles discussed in this paper apply broadly to all securities firms.

Scope

7. The effects of September 11th highlighted issues that are of great importance to the liquidity of both markets and firms, but are beyond the remit of this paper. The system-wide infrastructure issues related to settlements and electronic communications that were highlighted by the World Trade Center crisis will not be addressed.

Structure

8. The paper is structured according to "pillars" of current risk management practice: identifying, measuring, monitoring and controlling risk. In among those sections is a discussion of corporate governance that sets out the type of high-level risk management structures that the Technical Committee has observed at well-managed firms. Following these sections, the paper discusses some of the regulatory requirements with which securities firms must comply and then identifies some future challenges. The paper concludes by summarizing the core elements and key observations of the paper.

SECTION A: IDENTIFYING LIQUIDITY RISK

9. The first stage of effective liquidity risk management is to be able to identify the ways in which a firm's activities and outside influences can affect a firm's liquidity risk profile. While the specific liquidity risks faced by securities firms will depend on the nature, scale and complexity of their business, the survey identified a number of liquidity risks that are common to most firms. Before these are discussed, however, it is necessary to establish a common definition of "liquidity" and "liquidity risk."

The definition of liquidity

10. In defining liquidity for purposes of risk management, most firms generally think of the manner in which they achieve their liquidity "goals." The goal most often

articulated by the firms surveyed is to have sufficient funds to meet obligations as they arise without selling assets or, as one firm explained, to have excess liquidity in a normal environment and sufficient funding in a stress environment. However, it is useful to distinguish two important aspects to the definition of liquidity: the core component which can be defined as the ability to meet commitments when they fall due, particularly under adverse market conditions; and, for some firms, a broader component which consists of having sufficient, available, cost-effective funding through long term financing and improved asset mix to continue to pursue the firm's business strategy.

11. There is commonly a distinction made between asset and liability liquidity. Liability liquidity tends to refer to unsecured funding obtained from third parties whereas asset liquidity is cash obtained from the maturation, sale of assets or their use as collateral in secured funding (particularly repurchase agreements). Given this, the term "funding" usually refers to the way in which a firm obtains liquidity from the liability side of its balance sheet whereas "liquidity" is a broader term referring to all the cash and "near-cash" resources available to a firm. So, for the purposes of this paper, unless otherwise specified, the term "liquidity" will be deemed to incorporate "funding."[1]

12. It is also important to note that "liquidity" is not synonymous with "capital." Capital adequacy requirements are common to many jurisdictions and, indeed, the ability of a firm to bear liquidity risk is linked to the amount of capital it possesses and the losses it can absorb. However, the assets on a firm's books may not be sufficiently liquid to provide cash should the need arise. Similarly, a firm may have liquid assets readily available but be low on regulatory capital. As such, although sound liquidity management is critical to protecting capital, capital itself may not be an appropriate buffer in a difficult liquidity environment.

The definition of liquidity risk

13. Firms define "liquidity risk," therefore, as the risk to their ability to meet commitments in a timely and cost effective manner while maintaining assets and, for some firms, the inability to pursue profitable business opportunities and continue as a viable business due to a lack of access to sufficient cost-effective resources. The liquidity risk management practices of well-managed firms contain specific definitions that incorporate both core and broader components into their approach to liquidity risk management.

Sources of liquidity

14. As the definition above suggests, liquidity can be obtained from both sides of the balance sheet. On the liability side, firms can obtain funding in a variety of forms, both secured and unsecured, from a variety of lenders and for a variety of maturities; many firms also make use of committed credit lines. On the asset side, high quality, liquid securities can be easily and quickly converted to cash, used to obtain liquidity through the use of repurchase agreements (repos and securities lending) or posted as collateral to support various trading strategies.

[1] It should be noted that the survey sent out to firms referred to "funding and liquidity risk;" this terminology is also carried forward into the Annex containing firms' responses. Upon consideration of the survey results, the distinction was abandoned by the Committee for the reasons outlined above.

15. Each liquidity source, be it on the asset or liability side of the balance sheet, has its own characteristics in terms of cost, availability, maturity and, importantly, liquidity risk. Effective liquidity risk management utilizes the potential from both sides of the balance sheet and optimizes the use of all available sources while taking into account the risks associated with each type of liquidity source.

Major sources of liquidity risk

16. Liquidity risk can arise whenever the quantum of liquidity obtained from either the asset or the liability side of the balance sheets, is less than anticipated or liquidity needs are greater than anticipated. Given this, liquidity risk may arise where any of the following risks,[2] or any combination of risks, occurs:

- Market risk - the potential for losses arising from changes in the value or price of an asset, such as those resulting from fluctuations in interest rates, currency exchange rates, stock prices and commodity prices.

- Credit risk - the risk that a counterparty will fail to perform fully its financial obligations. It includes the risk of default on a loan or bond obligation, as well as the risk of a guarantor or derivative counterparty failing to meet its obligations.

- Operational risk – this can be defined in a variety of ways. For example, the Basel Committee has defined operational risk as the risk of loss resulting from inadequate or failed internal processes, people and system or from external events. This definition generally excludes such risks as the strategic risk associated with business decisions. However it does include some elements of reputational risk as well as legal and compliance-related risks.

17. These risks are often inter-related and their crystallization, either in isolation or in combination, can impact seriously upon a firm's liquidity risk profile. Ultimately, impaired liquidity can result in insolvency and can have repercussions for the market as a whole, causing tighter liquidity conditions in the affected markets and possibly systemic risk.

Liquidity risks of particular importance to securities firms

18. The integration of liquidity risk into a robust risk management system is essential to the ongoing viability of securities firms. Although there are a number of common liquidity risks faced by banks and securities firms, there are some risks that make sound liquidity risk management a particular challenge for securities firms.

Reliance on credit-sensitive liquidity sources

19. Whereas many banks enjoy a relatively stable source of core funding through unsecured customer deposits, securities firms are not deposit-taking institutions.[3] Consequently, they must rely on their own capital and on their ability to raise funds from external sources that leaves them relatively more exposed to the price and credit risk sensitivities of funds providers. In times of market stress, or for reasons inherent to the firm itself (such as a rating downgrade), liquidity may not be accessible on a

[2] As defined in "Risk Management Practices and Regulatory Capital - Cross-Sectoral Comparison," Report of the Joint Forum (IOSCO, Basle Committee, IAIS), November 2001.
[3] Broker-dealers may owe money to customers, but their use of this money is restricted.

timely or cost-effective basis, or in amounts sufficient to meet the needs of the firm, thereby endangering the firm's capital or very existence.

20. Similarly, unlike banks, securities firms do not have access to central bank funding on a daily basis or as lender of last resort. While firms belonging to a universal banking group may be able to obtain additional funding from their parent, stand-alone securities firms must be self-sufficient in terms of their liquidity needs, requiring a high degree of rigor and vigilance in their liquidity risk management practices.

Contingent commitments

21. Contingent commitments can arise, for example, from off-balance sheet derivatives instruments with optional or event-dependent components or from the granting of committed loan facilities. Periodic cash flows related to off-balance sheet positions are a potential source of liquidity risk, particularly if the optional or event-dependent components of the derivative instrument are not well understood, or if the cash flows are not adequately accounted for within the treasury and accounting systems.

22. Many of the firms interviewed do not, however, measure contingent commitments when calculating their liquidity requirements. In most cases, such firms do not hold positions that generate contingent liabilities such as OTC derivative positions whereas others consider that "these products generate a risk which (in their case is) negligible compared to the liquidity impacts issued by cash and securities activities." Some firms noted that they hold primarily exchange-traded contracts that are marked to market daily.

23. Prudent firms involved in activities that may generate contingent commitments forecast contingent liability requirements by analyzing the firm's trading positions under various market scenarios. Stress testing and scenario analysis are applied to evaluate potential cash requirements arising from early termination, collateral, and other credit provisions normally found in the firm's derivative contracts. In general, these firms appear to consider the probability of "draw-down," the on-balance sheet asset equivalent per legal entity, and pre-funding requirements.

Leverage

24. Many securities firms engage in leverage, which is, generally, defined as the ratio of a firm's debt to its ordinary share capital. However, this definition does not take into account actual "exposure" to risk through the use of derivatives, margin and other forms of borrowing. The use of leverage can give rise to liquidity risk in several ways. For example, a decline in the market value of a position can trigger the need for additional collateral or margin, potentially resulting in the forced liquidation of securities under adverse conditions if the firm does not have other readily available resources.

25. Leverage can be achieved, or increased, in several ways: unsecured borrowing, use of margin, collateralized borrowing or the use of off-balance sheet derivatives. In general, most jurisdictions have no direct regulatory requirements prescribing limits on the amount of leverage firms can use.

26. Several firms surveyed declared that leverage plays no role in the firm's management of liquidity or that "leverage is needed for their daily activity but, since they don't have funding problems from their parents, they do not assess its evolution." Although

firms that provide intermediation services only may not experience leverage directly, they may provide funding to clients through the use of margin accounts or repo and securities lending facilities. These firms may benefit from assessing the degree of leverage of their clients and the impact of adverse liquidity conditions on the client positions that may contaminate the firm.

27. In addition to being highly leveraged, some securities firms engage in sophisticated financial transactions as principal and provide services to highly leveraged institutions (HLIs). As such, the unique nature of these securities firms requires a rigorous and comprehensive approach to ensuring their liquidity needs. Consequently, the ability to forecast liquidity needs, understand the sources of risk, measure the potential impact of a risk materializing and ensure sufficient liquidity even under adverse market conditions are critical components of a robust liquidity risk management.

Firms that are part of a universal banking group

28. A few securities firms surveyed have either a very rudimentary liquidity risk management system or no such system due to their incorporation into a universal banking group and their reliance on the parent bank for funding.

29. The Committee recognizes that the activities of certain securities firms are limited to agency business, or acting as intermediary only and so acknowledge that the parents of such firms may adequately meet their liquidity needs and risks. However, the Committee would like to make certain observations that apply to all firms but are of particular importance to those firms that are part of a group:

- There may be regulatory restrictions regarding intra-group liquidity transfers that could prevent the transfer of funds should the need arise. Firms need to be aware of any such restrictions and the potential for "trapped cash."

- The resulting lack of diversification of funds providers is a significant source of risk that must be well understood by the firm. Firms would benefit from assessing how liquidity events at the parent company can affect their operations and from planning accordingly.

- Firms that act as intermediary may also provide margin accounts and other credit facilities to their clients. Firms would benefit from assessing the possible impact of liquidity crises on their customers' accounts and the resulting impact on their own liquidity positions.

30. Well-managed firms are able to identify the source of the risks and measure the potential impact for each profit centre, both at the business unit level and on a consolidated basis. While the formality and sophistication of the liquidity management process must be appropriate for the overall level of risk incurred by the firm, in well-managed financial groups where a securities firm is a significant business unit, it has its own liquidity risk management policies and procedures independent of its reliance, or not, on funding from its parent.

SECTION B: HIGH-LEVEL MANAGEMENT OF LIQUIDITY RISK

31. Due to the diversity observed in securities firms globally, the following discussion is necessarily general. Specific practices developed for an individual institution must be appropriate in terms of the nature, scale and complexity of its business activities as

well as its ownership structure and regulatory regime. Further, markets and management practices are continually evolving. Consequently, while the ultimate objective of prudent management does not change, individual solutions need to take account of the environment in which the firm operates and balance customer and systemic protection with the need to avoid imposing unnecessary costs and restrictions on commercial activity.

Board and Senior Management Responsibilities

32. Effective liquidity risk management requires an informed board, capable management and appropriate staffing. Well-managed firms are characterized by the establishment of a robust and coherent oversight structure in which the understanding and management of risks is an integral part. These firms have identified the various sources of risk to their business and have built into their corporate governance a structure for addressing each of them.

33. Prudent major firms strive to create a risk-sensitive culture throughout their organization. An awareness of the importance of a robust risk management system at the highest level of the firm, and close involvement of senior management in the process, form the foundation of sound risk practices. Well-managed firms also communicate throughout the organization the firm's approach to risk and all relevant information.

The role of the board of directors

34. The Board of Directors acts in an oversight capacity. It has the ultimate responsibility for the risks and exposures incurred by a securities firm and for establishing a level of tolerance for risk, including liquidity risk, though it may delegate that task to certain committees. It is the Board's role to approve the firm's liquidity risk strategy in line with the firm's expressed risk tolerance.

35. The Board is also responsible for establishing a structure for the management of liquidity risk including the allocation of appropriate senior managers who have both the authority and responsibility to undertake the firm's day-to-day liquidity management.

The role of senior management

36. Senior management has primary responsibility for overseeing the development, establishment and maintenance of policies and procedures that translate the goals, objectives and risk tolerances of the firm into operating standards consistent with the board-approved liquidity risk strategy. The precise management and reporting structures can vary as different firms make use of either individual officers or specific committees.[4] At many firms, however, the key functions are generally separated into two categories: strategy and policy on the one hand, and liquidity management on the other hand. At other firms surveyed, however, the segregation of duties was not so well defined. The basic principles of effective segregation of responsibilities and the independence of the compliance function generally, are critical to the proper functioning of any securities firm. To ensure appropriate independence, at prudent

[4] This would include (a) setting funding/liquidity policies (goals), including the establishment of strategies and procedures to achieve those goals, and (b) managing longer-term funding/liquidity needs and day-to-day liquidity risk**.** At major global firms, local executives provide input into the global, firm-wide policy setting and review.

major firms, the officer in charge of compliance reports to the CFO or appropriate committee.

37. Prudent firms recognize the importance of maintaining strong relationships with their liquidity providers in order to ensure the continuing availability of credit and allocate the role of negotiating credit lines to a designated officer at a sufficient level of responsibility within the organization.

SECTION C: MEASUREMENT OF LIQUIDITY RISK

38. Prudent firms have in place processes for measuring the liquidity risk to which they are exposed using a robust and consistent methodology. A number of techniques can be used, ranging from simple calculations to highly sophisticated modeling. The key is that firms should use a measurement method that is appropriate to the nature, scale and complexity of its activities.

Measurement techniques and other quantitative indicators

39. The types of measurement tools used reflect the fact that the crystallization of market and other risks may have a serious impact on a firm's liquidity position. Given this, market risk measurement tools are often used alongside measures of liquidity risk. The survey showed that the following measurement tools are commonly used:

- Target liquidity ratios and other quantitative indicators
- Interest rate, foreign exchange and derivatives exposures
- Value-at-Risk and other measures of market risk exposures

40. In determining the most appropriate measurement tools firms take into account various assumptions. For further discussion of these tools, please see the Annex.

Target liquidity ratios and other quantitative indicators

41. In determining the appropriate ratios to measure, firms give thoughtful consideration to the liquidity sources to include and to the valuation of any securities. Several firms interviewed stated that they do not rely upon unsecured sources (such as lines of credit, unless drawn) and are wary of estimating the pledge value of unhypothecated marketable securities, as estimates may not hold true in a crisis environment. While firms tend to define their own liquidity ratios to meet their unique needs, they also seek to maintain the ratios above pre-set levels. Definitions used by some of the firms interviewed are included in the summary in the Annex.

42. Firms look at a number of additional ratios or indicators to measure their ability to meet their liquidity needs, in particular under stressful market conditions. Other indicators include, for example:

- A “barometer” that would measure the number of days that the firm could survive if it found no new sources of funding.
- The “liquidation potential,” which measures how a firm could meet its funding needs in the first 14 days of a stress scenario.

- A “maximum cumulative outflow” (MCO) standard which determines the amount of short term unsecured funds required to fund cash outflows in a stress event, in order to maintain a funded liquidity cushion.

Mismatched cash flows, foreign exchange and derivatives exposures

43. Mismatched cash flows that result in a temporary liquidity deficit can leave a firm vulnerable to adverse market conditions that cause liquidity to dry up. Firms forecast cash outflows and require the maintenance of cash “cushions” or liquidity ratios over 100% with the objective of preventing negative cash positions over a prescribed period. A common technique consists of monitoring liquidity cash flows and mismatches in “time bands” or “time buckets” including, “overnight, one week, four weeks and nine weeks.” Other firms monitor duration and gaps. Risk modeling consists of calculating the sensitivity of the exposures to certain stress scenarios and ascertaining the impact on the firm’s liquidity position.

44. Given the relative importance of derivatives positions, both exchange-traded and OTC, to securities firms’ business it is important that such firms include in their liquidity forecasts the cash flows arising from these products. The large cash flows that can arise from margin calls on short-term hedges covering long-term sales contracts can result in serious liquidity difficulties.

45. Similarly, firms engaged in foreign currency transactions measure their exposures and liquidity position in each currency in which the firm operates as well as combining the results with domestic totals, both at the firm and group level. They may have a policy of matched funding or consistently employing hedging strategies to reduce or eliminate interest rate and currency risks. In developing appropriate measures, a prudent liquidity risk management system takes account of the specific characteristics of each country or monetary zone, including settlement standards and potential foreign exchange controls in times of market stress.

Value-at-Risk (VaR)

46. Losses arising from trading can have a serious impact on a firm’s liquidity position. Value-at-Risk is a quantitative tool that calculates the maximum expected loss on a portfolio within a certain degree of probability over a certain time horizon. A number of well-managed firms use VaR as a limits monitoring and capital allocation tool. VaR calculations do not, however, estimate the size of losses that may occur when the probability parameters are exceeded (the “tail"). When there are such losses, the resulting additional and unexpected liquidity needs may significantly strain the firm’s liquidity position.

47. In spite of their quantitative approach, risk models necessarily contain biases and assumptions. While most firms interviewed do not back-test, prudent firms are aware of the potential for model risk and consider appropriate back testing of their liquidity policies over a sufficient selection of time horizons in order to validate the robustness of their system.

48. Well-managed firms acknowledge the limitations of the VaR methodology, particularly in accounting for liquidity factors and so tend to augment their VaR models in order to take account of these limitations. Some firms incorporate modifications that correct for certain shortcomings including the effect of credit spread volatility on corporate bonds and adjustments for liquidity factors (i.e. the

volatility of the bid-ask spread). Other firms use stress and scenario analysis as an effective complementary tool.

49. Where appropriate, prudent firms perform frequent stress tests,[5] particularly during turbulent markets. However, while stress testing can be a valuable tool, it is not in all cases because it assumes the continuation of a certain set of market conditions such as correlations between instruments and the shape of the yield curve. During market shocks, however, historical correlations tend to break down and the assumptions may become irrelevant in the new environment. In such cases, stress testing is no longer appropriate. To prepare for such situations, firms need to conduct scenario analysis (see the section on "Controlling Liquidity Risk").

Liquidity at Risk (LaR)

50. Although not mentioned explicitly by respondents to the survey, the Technical Committee is aware that Liquidity at Risk models are currently under development. These models work on the same principles as VaR models and use a stochastic method for determining the values of the cash flows associated with various on and off balance sheet assets and liabilities. The Technical Committee is encouraged by the increased awareness of the importance of liquidity risk and firms' attempts to think about liquidity risk in new and creative ways but notes that, like all models, LaR models have their limitations. Firms considering using such techniques should be fully aware of the risks associated with them.

SECTION D: MONITORING LIQUIDITY RISK

51. Well-managed firms establish and maintain appropriate systems for monitoring the amount of liquidity risk to which they are exposed. An effective monitoring system begins with the establishment of effective strategies, policies and procedures.

Strategies, policies and procedures

52. Firms typically articulate strategies in a business plan to provide overall clear purpose and direction for the firm's activities. A firm's liquidity strategy supports the overall business strategy and is often articulated through the firm's definition of liquidity. For example, one firm reported its organization-wide definition of liquidity as the ability to generate or obtain sufficient cash or its equivalents, in a timely and cost-effective manner to meet commitments as they fall due. Liquidity management is critical in protecting capital, maintaining market confidence and ensuring that profitable business opportunities can be pursued.

53. The above definition illustrates the fact that prudent firms employ both a core and a broader definition of liquidity. The strategy sets forth a system for the management of liquidity risk as well as the goals to be achieved. Strategies focus on ensuring the ability of the firms to continue to operate and pursue new business through all market environments for an extended period of time without liquidating assets or raising additional unsecured funding.

---

[5] There are a number of definitions of stress testing, but for the purposes of this paper, we take it to mean the tests undertaken by firms to examine how the value of items on its balance sheet might change (usually using different confidence intervals) and consider how its overall business might be affected. Stress testing assumes that historical correlations and the validity of parametric statistical methods are not affected.

54. Accordingly, the goal of liquidity risk management, therefore, is to prevent, or to contain within an acceptable level, risks that would impede the liquidity strategy and, ultimately, the overall business strategy of the firm. Well-managed firms analyze and forecast their net funding and liquidity needs over certain time horizons, determine how to meet those needs and assess the possible impact of adverse market conditions on their business. The effectiveness of the strategy is reviewed regularly and the results communicated to senior management and/or the Board of Directors.

55. A number of firms surveyed have no articulated strategy for managing liquidity. Firms that are fully integrated into a universal bank group and funded by the parent bank would gain a greater awareness of their business by undertaking such an exercise and could contribute to enhancing the quality of the group's overall risk management.

56. One firm stated that its strategy relates to the management of "capital" rather than "liquidity." However, as noted above, "capital" is not synonymous with "liquidity" and capital alone may not provide an appropriate buffer in times of market stress.

57. Once the strategies have been established, the risks identified and the level of risk tolerance articulated, firms can develop a framework of policies containing specific and detailed guidelines for the day-to-day operation of the business, which are communicated throughout the organization. At well-managed firms, persons at a senior management level (and sometimes the Board of Directors), approve the Policies and Procedures.

58. Policies include specific goals designed to achieve the strategy and to mitigate risks. Risk mitigation essentially takes the form of setting specific boundaries on the firm's funding sources and utilization (asset mix and liability mix), as measured by various financial and management ratios, and of imposing certain diversification requirements.

59. Formalized procedures set out the way in which liquidity strategy and policies will be carried out. Well-thought out liquidity procedures eliminate uncertainty and duplication of effort. They also set out a structure of checks and balances designed to eliminate risks up front to the extent possible.

60. Well-managed firms employ a variety of measures that include documentation, approvals, internal transfer pricing and compliance. Senior management approves, signs and reviews the agreements on a regular basis.

61. Documentation related to credit lines constitutes the minimal level of formalization among those firms answering affirmatively with some firms simply signing credit lines with their parent company. Most firms interviewed indicated at least a minimal degree of formalization regarding intra-group liquidity transfers and, in some cases, pricing arrangements. Transferring liquidity internally on an arms-length basis (i.e. at a cost reflecting prevailing market conditions) allows firms to effectively assess their cost structure and profitability, leading to a more efficient allocation of capital.

62. The most robust and comprehensive internal structures are not isolated agreements but recognize the legal, tax, accounting, audit and treasury implications of such arrangements. At certain firms, the various agreements, limits and conventions that exist between the firms and their parent organizations are understood by all participants and internal account agreements reflect these limitations; the Compliance,

Legal and Tax departments review and approve agreements as necessary or required by statute or regulation; cash movements are administered through Treasury and recorded by Finance, and; at the group level, Treasury also monitors global inter-entity movements of funds as part of its liquidity measurement and management practices at the parent level.

Management information systems

63. An effective management information system allows a firm to review, and continually assess, the effectiveness of its strategy and monitor compliance with the firm's established policies, procedures and limits, by providing clear, concise, timely and accurate liquidity risk reports to the relevant functions within the firm.

64. Well-managed firms have reporting lines and responsibilities that are clearly established and followed. These firms possess a suitable management information system. The frequency of reporting is appropriate in light of the degree of sophistication of the business and the risks undertaken. It also varies depending on whom the report is being provided to. Weekly reports are provided in some cases to Corporate Treasury, a Managing Director, a Group Treasurer or an Executive Board. Quarterly reports are provided to the parent company in one case and the Financial Committee in another case. One firm indicated that they also report their liquidity position to the rating agencies on a quarterly basis.

65. Many firms have a comprehensive review process including daily monitoring of funding capacity and capacity utilization, weekly reports of the firm's balance sheet usage, and a formal quarterly review of the system conducted by an appropriate committee. Almost all firms measure their liquidity positions daily using, for example, ledger balances (supplemented with spread sheet analysis), loans and placement systems, trading systems, MCO and Cash Capital models, daily liquidity positions, and reconciliation of data and aggregate balances to the firm's financial accounting and/or regulatory reports. One firm relies on reports provided by the back office systems to measure its liquidity needs.

SECTION E: CONTROLLING LIQUIDITY RISK

66. A robust framework for managing liquidity risk necessarily includes a system of internal controls that is appropriate in light of the scale, nature and complexity of a firm's activities. Effective controls allow the firm to monitor the effectiveness of its liquidity strategy, the amounts of liquidity risk undertaken and compliance with established policies and procedures. A robust system of internal controls is critical to the integrity of liquidity risk management.

67. Major firms recognize the importance of clearly defined roles and reporting lines, including appropriate segregation of duties, along with the involvement of senior executives, as key elements in the control process. The Treasury Managers and the CFO are primarily responsible for monitoring liquidity with Risk Management Departments and both internal and external auditors responsible for internal controls. However, at some firms the Board of Directors is informed regularly of the liquidity position of the firm and advised immediately of any event that could have a material impact on the firm's liquidity.

68. Sound risk management practice includes frequent compliance reviews and regular independent audits. At well-managed firms, policies and procedures, and compliance

with policies and procedures, are subject to scrutiny by compliance and internal audit at regular intervals. The results of compliance reviews and audits are also communicated to the Board.

Limit setting

69. One of the most effective ways of controlling risk is to set limits. Prudent firms set targets and limits on absolute and relative amounts of exposures or acceptable risk in accordance with the nature, scale and complexity of its activities. The survey identified a number of areas where firms set limits that reflect the fact that the crystallization of a number of risks can increase a firm's liquidity risk profile.

Concentration limits and diversification

70. Well-managed firms recognize the importance of appropriate diversification on both sides of the balance sheet and specify in their policies various limits designed to contain risk. Diversification is a method of spreading risk such that the impact of the materialization of a risk factor in one area is contained within reasonable limits or the negative effect in one area is offset by a positive effect in other areas. Conversely, concentration in any one area is a risk factor that is generally subject to strict limits and controls.

71. Most firms' diversification policies entail *creditor diversification* (e.g., insurance companies, mutual funds, banks, corporations, etc.) including limiting the amount or percentage of commercial paper held by any one investor, *spreading debt maturities* (e.g., target weighted average life of debt of approximately 4 years), *diversity of funding instruments* - secured and unsecured (e.g., use of repurchase agreements, securities lending markets, issuance of long term debt in the public and private markets, use of a variety of short-term funding instruments such as commercial paper, promissory notes, letters of credit, bank loans, direct deposits), and *diversity of markets* (e.g., U.S., Europe and Asia).

72. On the other hand, many securities firms that are part of a banking group do not have a diversification strategy for funding sources but rely solely on the parent bank to provide liquidity as needed through capital, subordinated debt, and call loan or revolving credit facilities (see the later discussion of regulatory limits on intra-group exposures). Nonetheless, even these firms may find it prudent and possible to avoid large concentrations. For example, they may spread their debt maturities and limit their short-term liabilities by stipulating that only a certain percentage can be borrowed overnight. Additionally, they may subject any secured funding practices (repo and securities lending) to actively managed credit risk limitations on counterparty exposures. These mechanisms of counterparty, geographic, instrument concentration and maturity spreading can be consolidated at the parent bank level and incorporated into group-wide policy targets.

Other limits

73. Most of the limits set by firms fall into the category of diversification or concentration limits. The survey showed, however, that well-managed firms also set limits on:

- Cash flow mismatches over certain extended time horizons;

- Their exposures and liquidity position in each currency in which it operates as well as combining the results with domestic totals, both at the firm and group level. In setting limits, a prudent liquidity risk management system takes account of the specific characteristics of each country or monetary zone, including settlement standards and potential foreign exchange controls in times of market stress; and

- Leverage ratios and target acceptable amounts based on low-level multiples of shareholders' equity. These firms measure net (total assets - securities purchased under agreements to re-sell)/total equity), and gross leverage (total assets/total equity) weekly to ensure that the firm operates within a net and gross balance sheet that is consistent with the secured and unsecured funding franchises of the firm.

74. Prudent firms periodically review and, where appropriate, adjust their limits when conditions or risk tolerances change. They also have in place, policies and procedures that ensure that limit exceptions receive the prompt attention of the appropriate members of management.

Scenario testing

75. Given that liquidity difficulties are often caused by events that fall into the tails of a probability distribution, many firms choose to use scenario analysis to test the liquidity risk to which they are exposed. When conducting scenario analysis firms subject their positions to certain hypothetical "shocks," simulating extreme market conditions in order to consider the effects both on and off balance sheet, and on both assets and liabilities. This enables them to assess the adequacy of liquidity in an emergency situation.

76. Most of the firms surveyed test a variety of scenarios that break away from historical correlations, spreads and "normal" market conditions. Previous market events may provide a basis for choosing appropriate scenarios but it is unlikely that future events will be the same as historical ones. Given this, firms should think creatively about the scenarios they test. The precise scenarios that an individual firm chooses to test will depend on the nature of its activities but, in general, firms should consider scenarios based on varying degrees of stress and both firm-specific and market wide difficulties.

77. When considering the possible on and off balance sheet changes that might occur during the scenarios under test, firms should pay particular attention to possible changes in the market's perception of the firm and the effect this will have on its access to the markets and the fact that general market turbulence may trigger a substantial increase in the draw down of contingent commitments.

78. Like stress-testing, prudent firms test their scenario analysis models at least twice a year and more frequently during turbulent markets. In addition, firms should frequently review the assumptions underlying the scenarios they test in order to ensure that they remain valid.

79. The added value of performing scenario tests with respect of liquidity and funding risk is the ability and willingness of firms to think imaginatively and creatively about a number of plausible scenarios and to incorporate the results into strategic decisions.

Contingency Planning and Crisis Management

80. Prudent firms have in place a contingency plan that addresses the strategy for handling unexpected events that severely strain the firm's liquidity, including specific procedures for raising cash in emergency situations. These "Funding Action Plans" or "Contingency Financing Plans" detail "key tasks" that need to be performed within certain time lines. The tasks may be dependent upon the severity of the crisis at hand as outlined in a variety of scenarios.

81. The plans generally focus on conserving or creating liquidity, by specifying the order in which liquidity reserves are to be accessed and any limitation or modification of trading activity. Key components of these plans include estimating the funding requirements or potential fund erosion for material legal entities, determining the pledge value of firm collateral, and preparing cash projections for the holding company's global funding chain. Some firms also include estimates of additional needs for liquidity during a crisis environment, such as limited repurchase of long-term debt to demonstrate that the firm has sufficient liquidity sources. Other firms' contingency planning consists of endeavoring to avoid liquidity crises by establishing sufficient funding to continue to operate for one year with no new unsecured funding.

82. Other practices include depending on committed credit lines or relying on capital held in excess of the minimum required by law. One firm even stated that it would simply "downsize its balance sheet" if it needed liquidity in a crisis environment. These practices may cause some difficulties, however, in times of crisis.

83. Even committed lines of credit may not be honored in times of crisis (indeed, several firms (including those with bank holding companies) stated that they do not count on committed facilities in a liquidity crisis). In addition, although "excess" capital may be available to a firm, the amount of the cushion may diminish substantially in a time of crisis, where the firm may have higher liquidity needs and little if any ability to secure new funds. Moreover, "downsizing the balance sheet" (i.e., selling assets to raise money) could accelerate a firm's financial deterioration by forcing sales in a weak market, thus substantially reducing proceeds.

84. On the other hand, several firms interviewed indicated reliance on the parent entity without any further procedures in place or measures to be taken in the event of a "liquidity crunch" while others limit their strategy to the maintenance of a certain liquidity cushion which is deemed sufficient in the event of market stress.

85. While it is impossible to plan for every eventuality, the absence of thoughtful planning can severely inhibit the ability of securities firms to respond appropriately in the event of a liquidity crisis and may ultimately endanger the viability of the firm in certain circumstances. Even firms that do have contingency plans review and improve them periodically in light of market events and their impact on the firm's liquidity.

Use of collateral

86. Many firms consider that stressful market conditions are adequately dealt with through the use of haircuts. Securities firms apply haircuts to collateral: a) to provide protection against bad debt; and b) to provide ample margin so that the firm can re-hypothecate the securities if necessary.

87. The amount of the haircuts is based on asset quality and detailed security classification. Firms may also apply haircuts to equities based on the underlying activity, that is, whether the security is held for equity arbitrage, proprietary trading, etc.

88. The haircut ratios are determined in some instances by a Credit Department but may also result from guidelines emanating from a supervisory authority such as the US Federal Reserve or a self-regulatory organization. The guidelines are intended to ensure that the dealer secures sufficient collateral from clients on the day's closing market value of outstanding positions and collateral for margin loans and short sales. Another firm simply applies haircuts to client collateral "on the same basis as brokers charge (them)".

89. Margin ratios are determined per type of security. One firm noted that collateral other than securities would be considered on a case-by-case basis. Firms consider a combination of factors in determining the haircut rates, including refinancing capability of the collateral, liquidity and price volatility, and credit profile of the clients. Indeed, some firms haircut the value of collateral to "0" for certain customers to take account of local legislation.

90. However, the management of haircuts and collateral levels, including daily and intra-day valuations and margin calls, is labor-intensive and requires a sophisticated operational infrastructure. Legal issues related to the ownership of collateral and operational delays for cross-border transactions can render the haircuts ineffective. Reducing the haircut amounts in an attempt to attract business further reduces the effectiveness of this technique.

SECTION F: REGULATORY REQUIREMENTS

91. In general, the focus of regulation for securities firms is on capital requirements that incorporate implicitly asset liquidity in determining the relevant capital charge. However, those firms that are members of a banking group are indirectly subject to the liquidity rules applicable to banks.

Capital and Reporting Requirements

92. As stated above, liquidity is not synonymous with capital. Having said this, most jurisdictions currently do not regulate the liquidity risk management practices of securities firms directly. However, in a number of jurisdictions, these firms are subject to regulatory capital rules that incorporate implicitly asset liquidity by imposing specific haircuts on assets for purposes of determining whether the firm meets minimum capital requirements. In those countries, there are periodic (usually monthly) reporting requirements regarding the firm's compliance with minimum capital standards.

93. The two main techniques for determining capital adequacy are the "net capital" and "risk weighted capital" models. Whereas both aim to provide adequate financial resources for an orderly wind-down, the former tends to emphasize having enough liquidity to do so, whereas the latter focuses on having adequate capital. One of the key consequences of both sets of capital rules, however, is a disincentive for firms to hold illiquid assets.

94. In effect there are, however, certain reporting requirements in some countries for firms within a bank holding company structure. In these jurisdictions, universal banks (including their brokerage and dealer activities) must report a liquidity ratio (regarding short-term assets and liabilities) or a "long term mismatch ratio. One jurisdiction requires the firm to submit a credit facility summary, and to notify the regulator where 1) aggregate bank borrowings exceed total limits of such facilities; 2) the firm has been unable to meet calls or demands for payment by any lender for three consecutive business days, or 3) any lender has exercised its right to liquidate the firm's collateral in order to reduce the debt.

Intra-Group Liquidity Transfers

95. Although intra-group transfers are generally not prohibited per se, such transfers are often subject to conditions set by regulators that make them costly. For example, a broker-dealer may not be permitted to book a loan to an affiliate as an asset. Depending on the jurisdiction, this may be directly prohibited, or indirectly through the imposition of a 100% haircut on the receivable or any deposits held at the affiliate. One jurisdiction prohibits broker-dealers from making a loan to a global parent bank or its branches on an un-collateralized basis and, under certain circumstances, imposes indirect restrictions on transfers of liquidity to parents or other affiliated entities (by, e.g., prohibiting withdrawal of capital if net capital reaches "early warning" levels). Others simply have limits on balances with affiliated companies.

96. Therefore, firms should carefully consider and fully understand the implications that their legal structure may have on their ability to shift liquidity among different entities within their group, including to a parent company or holding structure. Any constraints should be built into the management information system used to monitor liquidity. Firms would be well advised to pay particular attention to legal restrictions on liquidity transfers among international affiliates.

CONCLUSION

97. As stated at the outset, the purpose of this paper is threefold: 1) to promote awareness of the need for sound liquidity risk management and related internal controls at securities firms, 2) to highlight particularly commendable practices, and 3) to identify areas for improvement. The paper may serve as a reference for securities firms and their supervisors in establishing and reviewing their respective practices.

98. The results were, in the main, encouraging and demonstrated that firms have begun to devote time and resources to addressing this important area of risk. From observing the practices of large, well-managed securities firms it has been possible to derive a certain number of principles for the sound management of liquidity risk. This paper has attempted to highlight commendable practices while drawing out areas where certain firms could benefit from devoting greater attention and care.

Commendable practices

99. The degree of sophistication of a firm's liquidity management system should appropriately reflect the nature, scale and complexity of the business model and ownership structure. However, the Committee has identified certain core principles that apply to all firms:

- Executive involvement is key to ensuring the success of liquidity risk management; prudent major firms strive to create a risk-sensitive culture throughout their organization.

- Well-managed firms establish and maintain appropriate systems for identifying, measuring, monitoring and controlling the amount of liquidity risk to which they are exposed.

- A liquidity risk strategy is an integral part of a prudent risk management framework and should set out the general approach that a firm will take to liquidity risk management consistent with its risk appetite.

- The objectives and risk tolerances set out in the liquidity risk strategy should be translated into policies and procedures which set out operating standards that are understood by the relevant members of the firm's personnel.

- Policies and procedures, and compliance with policies and procedures, should be subject to regular scrutiny by compliance and internal audit. At well-managed firms, persons at a senior management level (and sometimes the Board of Directors), approve the policies and procedures.

- A robust and coherent oversight structure should be established in which the understanding and management of risks is an integral part. Well-managed firms have reporting lines and responsibilities that are clearly established and followed.

- An effective management information system should be established.

- Firms should have a comprehensive set of targets and limits on absolute and relative amounts of exposures or acceptable risk that are periodically reviewed and, where appropriate, adjusted when conditions or risk tolerances change.

- Firms should think about the liquidity risks to which they may be exposed in stressful situations by performing scenario analysis using a variety of creative and forward thinking scenarios.

- Firms should have in place a contingency plan that addresses the strategy for handling unexpected events that could severely strain the firm’s liquidity (such as those identified as part of the scenario analysis), including specific procedures for raising cash in emergency situations.

- Finally, firms should strive to update continuously and improve their liquidity risk management systems.

Areas for improvement

100. Although the survey highlighted that firms have taken steps to consider the liquidity risk to which they are exposed, there remains room for improvement.

101. The most serious deficiency was the tendency of a few firms that are integrated into a universal bank group to rely on their parents as a source of unsecured funding. Some of these firms have not considered the liquidity risks to which they are exposed and do not have in place systems to identify, measure, monitor and control them.

102. While the Committee acknowledges that where a universal bank group has an integrated liquidity risk management structure, some reliance on intra-group funding is appropriate, legal entities within the group should still consider the liquidity risk to which they are exposed.

103. The absence of a thorough understanding of liquidity risk at the level of the legal entity could result in problems that affect the whole group. In well-managed financial groups, where a securities firm is a significant business unit, that firm should have its own liquidity risk management policies and procedures independent of its reliance, or not, on funding from its parent.

Future challenges

104. The changing complexion of the financial environment makes future liquidity risk management yet more difficult as firms face new challenges. For example, globalization and the cross-border flow of funds and securities may pose specific challenges to liquidity risk management as time zone differences may hinder a firm's ability to obtain cash or securities necessary for completion of a transaction within the settlement period prescribed by a particular regulatory regime. So, while the management of liquidity risk has, in general, improved greatly in recent years, the Committee emphasizes that, going forward, the changing financial environment requires firms to devote resources to ensuring their liquidity risk management systems remain able to cope with the challenges that are likely to arise.

Annex I

Survey on Funding and Liquidity Risk Management at Securities Firms

Preface

A mandate was approved in January 2001 for the Technical Committee's Standing Committee on the Regulation of Market Intermediaries (TC-SC3) to survey systems and processes used by prudent, major firms in the securities industry in the management of liquidity risk under a variety of market conditions. TC-SC3 also was to examine firm liquidity policies, the ways in which these are managed and monitored, balance sheet management techniques, and the use of supplemental liquidity tools, such as revolving lines of credit.

Sound risk management and internal controls are of concern to securities regulators. The purpose of the questionnaire was to provide information to serve as a basis for a report intended to provide guidance to regulators and firms on sound practices concerning:

- the maintenance of appropriate internal systems and controls to establish and monitor liquidity policies;
- the ability to liquidate assets rapidly and in an orderly way, while meeting daily funding obligations, under a variety of market conditions, and meeting customer and creditor demands;
- the maintenance of liquid resources sufficient to fund commitments, particularly those maturing within one year;
- the use of funding models, including alternative funding strategies, that are adequate to protect against plausible runs on the firm, or against large unanticipated cash requirements;
- global liquidity policies that account for the concentration of liquidity in specific markets and instruments, or from particular sources; and
- issues raised by cross-border transactions, such as longer settlement periods or gaps between settlement dates.

It was also specified in the initial mandate that the work will complement work already undertaken by TC-SC3, particularly in the area of capital adequacy. Capital adequacy is related to liquidity because well-capitalized securities firms rarely have liquidity problems. Capital adequacy differs from liquidity, however, because capital adequacy requirements are regulatory in nature, whereas liquidity is a cash-based concept. A firm may have liquid assets readily available but be low on regulatory capital, for example. Additionally, because standard Value-at-Risk (VaR) models do not adequately address liquidity risk, overall risk may be underestimated and regulatory capital may be inadequate, heightening the potential for systemic risk.

It is anticipated that the study will also complement work being done by the group in the areas of credit risk and operational risk.

Purpose:

TC-SC3 is conducting a study of the way in which securities firms manage funding and liquidity risk. The purpose of this questionnaire is to survey the policies, systems, and techniques used by major firms in the securities industry in the monitoring and management of funding and liquidity risk under a variety of market conditions. TC-SC3 will use the responses to the questionnaire as a basis for a report intended to provide guidance to regulators and firms internationally on sound practices in this regard. Individual answers will not be published and will be kept strictly confidential.

Guidelines for answering:

1. Bank-owned securities firms or banks responding on behalf of their broker/dealer subsidiary should, to the extent possible, answer from the perspective of the securities firm as a separate entity or indicate the policies adopted on behalf of and applied to the subsidiary. In all cases, "firm" refers to the broker/dealer.

2. For universal banks, "Securities firm" should be understood to include brokerage activity (firm acting as intermediary) and dealer activity (firm acting as principal) as well as proprietary and client-generated trading activity. Typically, for example, in North America investment banking activities would be included within a securities firm structure. Asset management, however, would not fall within the scope of the survey as investment funds manage client money, not the firm's.

3. Where applicable, indicate any and all assumptions used in formulating responses.

Questionnaire

I. General

1. How does the firm define "liquidity" for purposes of risk management? If risk management policy or any portion thereof is determined by an entity other than the firm, indicate the name of the entity and the entity's relationship to the firm.

One firm had no formal definition of liquidity.

Some firms provided specific definitions of liquidity, such as: (1) "the value of unencumbered assets (after haircuts) plus the revolving credit facility," or (2) "cash plus the borrowing value of unencumbered securities that can be pledged to obtain secured funding plus the unsecured portion of the firm's committed revolving credit facility," or (3) "unsecured funding available to the holding company (i.e. not trapped in the regulated chain), such as cash and high liquid investments made by the firm's treasury."

However, the core definition observed at most firms revolves around the ability to meet day-to-day obligations. For example, "the ability to generate or obtain sufficient cash or its equivalents...to meet commitments as they fall *due," or "immediately available funds enabling the firm to meet its day-to-day obligations."*

Some firms extended the core definition further to include the notion of market stress: "allow the firm to continue operating in a difficult liquidity environment without balance sheet liquidation" and "net realizable cash value of the firm's assets under adverse market conditions."

One firm is more specific about the possible impact of market stress on liquidity and includes the notions of timeliness and cost in their definition. For this firm, liquidity is "the ability to generate or obtain sufficient cash or its equivalents, in a timely and cost-effective manner, to meet commitments as they fall due."

Another firm offers slightly different perspectives on liquidity for the dealer and for its parent bank, which reflects the different focus in their respective businesses: "Liquidity risk in the dealer is the ability to maintain, repay or replace existing funding sources through holdings of available assets of sufficient market depth (ability to realize market value) or collateral value, which can be sold or lent to secure cash to meet these funding obligations... Liquidity risk in the parent bank is defined as the exposure resulting from cash flow timing differences of assets and liabilities."

While the notion of meeting day-to-day commitments can be seen as a relatively passive goal, certain firms also included a more active approach to liquidity, for example, "securing funding instruments to hold trading assets, and managing funding duration and surplus amount." One firm balanced both approaches in the following definition: "The control of the financial position of the company in order to face and address both the structure of its balance sheet and its activity strategy."

Finally, in its organization-wide definition, one firm incorporates both approaches into a statement underlining the importance of liquidity management to the firm: "Liquidity management is critical in protecting capital, maintaining market confidence and ensuring that profitable business opportunities can be pursued."

II. Legal and Management Structure

1. Describe the legal structure of the firm (corporation, partnership, wholly-owned subsidiary) including the firm's holding company and its regulated and unregulated subsidiaries and affiliates if applicable.

1 abstention for privacy reasons
6 stand-alone securities firms / partnerships / investment banks
1 subsidiary of a stand-alone securities firm
11subsidiaries of universal banks or diversified financial group

2. **Is liquidity and funding managed:**

   a. **Centrally, at the holding company level or by a designated subsidiary or in a decentralized manner by each entity separately (branch, business line, etc.)? Please explain; and**

   b. **On a global or a regional basis? Please explain.**

Most of the firms manage liquidity at the local level, in particular to take into account local rules and time differences. One firm manages liquidity in a generally decentralized manner except for North America where it is "managed (at the) regional holding company level."

For those firms with a holding company or parent company structure, policy is determined centrally with the day-to-day implementation being the responsibility of each entity. However, even where the structure is centralized, the regions retain a strong role in the decision-making process. One firm "manages domestic funding and liquidity risk in its main office, but decisions in the overseas offices are handled by the office heads and the treasurers in the office separately." Another firm related that "Liquidity is managed centrally... with strong input from the regions. Each region manages its liquidity within the global framework, but subject to local regulatory and market influences." Two other firms whose liquidity and funding are managed at the holding company level but on a global basis, address regional issues within a global forum.

Some firms distinguish between short term and long term funding with the long term (undoubtedly seen as more strategic) being managed centrally and the short term "managed on a decentralized basis." Two of the firms interviewed specified that they are "set up on a regional basis (Europe, Asia and America)," and that "In each of these areas, the target is to dedicate only one funding centre per currency."

Most firms that manage liquidity on a regional basis nevertheless consolidate the reporting into a global view of its operations. As one firm said, "Liquidity is calculated on a regional basis and consolidated into the total." Similarly, another firm specified that although liquidity and funding are managed on a regional basis, "reporting and oversight (are) consolidated on a global basis in the Parent Bank's Liquidity Management group, within the global Treasury function."

3. **What is the firm's management structure to oversee funding and liquidity risk?**

   a. **If the firm is an independent broker/dealer;**

   Are there personnel at the firm who are specifically responsible for:

      i. **Setting funding/liquidity policies (goals) and establishing strategies and procedures to achieve those goals,** *In four of the firms, primary oversight rests with the Treasurer who reports either to the Chief Financial Officer (CFO), another executive officer or a risk committee. One firm confirms having appointed a dedicated person for the role but did not give a title. In one firm, the Managing Director (who reports to the CFO) is responsible for policies, strategies, risk management and monitoring, while a Senior Managing Director handles day to day funding and liquidity, and reports to the Treasurer. These firms also make use of committees. For example, one uses a Risk Oversight Committee that oversees goals for managing all risk, while another has an Asset and Liability Committee that meets weekly to discuss global funding issues.*

Other firms use more of a committee structure. For example, one uses a Finance Committee (establishes policies, guidelines, compliance), Corporate Treasury (obtains funding, monitors and ensures compliance), and Equities Global Funding Desks. Another uses a Capital Allocation and Risk Management Committee (senior risk oversight body), Corporate Treasury (develops policy and does long term debt issuance) and a global money markets group that executes short term funding.

ii. Establishing and maintaining relationships with liquidity providers (such as correspondent banking officers), and

At four of the firms, the Treasurer or General Manager of the Treasury Department negotiates the lines and reports to the CFO. At another firm, the negotiation is done by a team within Corporate Treasury on a country-by-country basis. At another firm, the negotiation is done by Creditor Relations, a division of the Treasurer's office (overseen by the Global Treasurer). At the last firm, the Senior Managing Director negotiates the lines and reports to the Treasurer. One firm reported that relationships with securities lending and repo counterparts are maintained by the Equity and Fixed Income Departments respectively.

iii. Managing longer-term funding/liquidity needs and day-to-day liquidity risk?

At most firms, the Treasury Department is responsible and reports to the CFO. The responsible person at corporate treasury is called a Director, General Manager, Managing Director, or Head of Corporate Treasury. In one firm, the CFO is responsible for the long term while the Treasury Department retains responsibility for the day-to-day operations.

One firm reports a more collegial approach in which the "Treasurer (treasury department) sets longer-term funding strategy and then a board authorizes each solution such as issuing bonds, lending from banks, etc."

One firm commented that the responsibilities are ultimately assumed by a large, interactive group of people.

b. OR, If the firm is owned by a bank or other entity;

Are there personnel at the firm who are specifically responsible for:

i. Participating at the group level in policy/goal setting similar to (i) above, and

The group was evenly divided on this point with half of the firms having no input and half of them participating in setting policy. One firm indicated, however, that while they do not currently contribute to setting policy, this may change in the future.

One firm which did not have input described their relationship to the holding company as a "provider / client one."

On the other hand, one of the firms that acknowledged a more active role indicated that "The Treasurer of each entity is solicited as required for input into the global firm-wide liquidity policy and target process within the parent bank as well.

ii. Implementing the funding/liquidity policies and strategies on a day-to-day basis?

If yes, please identify the titles of the personnel (including reporting relationships) and relevant committees and departments, as well as their duties.

The structures at the firms interviewed were actually quite diverse with certain firms viewing liquidity as an administrative, cash management function while others tend to approach it from a more strategic funding, risk management and balance sheet perspective.

In those firms with a more administrative approach to liquidity, the Treasury Manager reports to a Group Back Office Director of a Group Operations Director. One firm explained that "Other functions performed by the Treasury Department include cash processing, client money reporting, hedging, bank reconciliations and interest." Another states that "The treasury manager, who reports to the Back-Office Director of the group, is in charge of day-to-day excess cash investment and/or drawing of the facility extended by the group."

In one of the firms with a funding and risk management perspective, the responsibilities were described as follows:

1) "The <u>VP and Treasurer</u>, reporting to the CFO, is responsible for liquidity oversight and reporting (N.B. to Corporate Treasury Department at the parent) on liquidity measures at the firm. (He) is also responsible for negotiating intercompany credit lines (secured and unsecured) with its parent."

2) *"The Global Managing Director, Money Markets (who reports to the Head of Global Markets), supported by the Managing Director, Trading, Credit Administration, is responsible for other third party funding arrangements" such as repo and securities lending agreements.*

Another describes their structure as follows:

1) *"the Treasurer of each dealer is responsible for managing and implementing cash management and funding policies of the dealer in accordance with all the prescribed regulatory and parent guidelines. In the event the capital structure requires adjustments, the Treasurer will work in concert with the parent bank's global capital management department to effect required changes."*

2) *"The Chief Financial Officer within the Finance Department is responsible for measuring and reporting adherence to regulatory compliance of funding and balance sheet practices."*

III. Liquidity Policy and Management

1. a. Does the firm have written or otherwise formalized policies and procedures that set forth a system for the management of liquidity risk? If yes, please describe the goals of this system, the various factors that the firm considers and the methods employed to achieve these goals.

(For example: Does the firm have goals pertaining to the overall size and composition of its portfolio? Does the firm set targets for the degree of liquidity of assets and their ability to be funded - e.g. secured vs unsecured financing, short term vs long term investments?)

Three of the firms have no written (or otherwise formalized) policies and procedures that set forth a system for the management of liquidity risk. One of the firms explains this by the fact that there is only one funding source, the parent bank, and that their requirements consist only of meeting calls for capital made by clearing houses.

Another firm considers that it manages "capital" rather than "liquidity" with the objective of maintaining "sufficient capital to absorb... changes in asset value." As such it does not have explicit liquidity policies and procedures but focuses rather on capital.

Among the firms that do have formal policies, some of the stated goals are as follows:

- *conservative funding and cash management strategies which ensure adequate liquidity under extreme adverse market conditions.*
- *to maintain a short term (1 month) liquidity ratio under control, and an adequate level of long term liquidity gaps, based on various*

assumptions (liquidity of securities portfolios, stability of retail deposits).

- *maintain a buffer of $M.*
- *maintain a highly liquid balance sheet and significant cash equivalents to ensure immediate funding availability.*

Certain firms articulate more elaborate goals with respect to liquidity that incorporate several factors. For example, one firm stated that the integration of its secured and unsecured fund strategies and capabilities is central to its funding framework, and that its objective is to manage and stabilize liquidity requirements such that it maintains the firm's customer franchise through all market environments and retains investment grade ratings. Another firm said its goal was to ensure that it can at all times shift to secured funding in a stress environment to redeem maturing unsecured debt for a 12 month period without (1) liquidating assets, or (2) raising additional unsecured funding. They would do this by having "positive net cash capital" and a liquidity ratio of at least 100%.

Finally, one firm stood out from the others by asserting that it does not have goals pertaining to the overall size and composition of its portfolio. Rather, it looks at the entire portfolio as available for funding. This firm also does not have targets for the degree of liquidity of assets and their ability to be funded (e.g., secured vs unsecured financing, short term vs long term investments). Instead, they look at the liquidity ratio, as described below (see the responses to Question 6). If the ratio decreased, the appropriate business line would issue more term debt, or modify its asset holdings, to raise the ratio.

The methods used to achieve the above goals include maintaining portfolio and market risk limits, applying haircuts or using asset mix targets and liability diversification strategies . Several firms use asset allocation policies to control liquidity risk.

One firm outlined its general asset mix trend that is intended to ensure adequate liquidity:

Government, Sovereigns and money markets (9%)
Derivatives (12%)
Resale Agreements (16%)
Borrowed Securities (32%)
Segregated cash and receivables (16%)
Equities, Corp. Bonds and Municipals (11%)

Market conditions (e.g., stress conditions) are dealt with by most firms through the consideration of appropriate haircuts, contingent commitments, unencumbered assets, trapped cash in regulated entities, etc. One firm actually creates models that determine the amount of short term unsecured funds required to fund cash outflows in a stress event, and calculates a "completely reliable" secured fund capacity available by each product in a crisis environment. Another firm accounts for stressed market conditions *through the establishment of a multi-billion dollar "lock box" of cash stored at a bank.*

Other methods described include "new product and investment approval processes and other economic resource allocation models wherein capital and funding capacity is a factor."

The following factors were mentioned by the firms in considering their liquidity and funding risk management policies and procedures:

- *various financial ratios*
- *interest rate risk exposure*
- *duration risk limits, gaps*
- *cash flow limits by time horizon, by asset class and by funding criteria*
- *overall portfolio and market risk limits*

b. Is this system reviewed on a regular basis? If yes, how often and by whom? On the basis of what criteria?

Three firms stated that they do not review their policies and procedures pertaining to liquidity management.

Three firms acknowledged an annual review only. At two of those firms, the policies and procedures review is approved by the Board of Directors.

One firm's policies are subjected to a "review by the Group Financial Committee, upon ALM department's proposals, on a biannual basis."

Three firms review the system on a quarterly basis. In these cases, the review is conducted by a Capital Allocation Committee, a Risk Management Committee, or an Assets and Liability Committee.

The CFO of one firm reviews "Weekly reports setting out the firm's balance sheet usage, liquidity sources and utilization" and reports "to the Management Committee regularly on the capital and funding issues."

At eight of the firms interviewed, these systems are informally reviewed on a daily basis. In general, formal reviews are conducted quarterly, usually by the Treasurer, or personnel that reports to the Treasurer. One firm has a special group (reporting to the Treasurer) review its system weekly.

One firm reports a comprehensive review process which it describes as follows: "The Finance department reviews compliance to capital daily. This is on the basis that sufficient margin on allowable (liquid) assets plus non-allowable (illiquid) assets should not exceed the total amount of capital in the dealer. The Treasurers monitor the daily funding capacity estimate daily. This is measured as the total unused collateral value that could be lent to secure additional funding."

Finally, one of the firms added that their funding and liquidity risk management policies and procedures are reviewed annually with the rating agencies.

2. **If applicable, what structure is in place to govern intra-group liquidity transfers, such as written agreements, conventions, limits, conditions and procedures?**

Most firms interviewed indicated at least a minimal degree of formalization regarding intra-group liquidity transfers. One firm that did not have a formal procedure in place indicated that a system is being developed but the issue is "not felt to be critical."

The firms employ a variety of measures that include documentation, approval/compliance and pricing.

Documentation related to credit lines constitutes the minimal level of formalization among those firms answering affirmatively. For example, one firm stated simply that "They sign credit lines with their parent company (the Bank)." Another explained that "The firm is a liquidity taker from the holding company. Such relationship is based on a credit line granted from the holding company to the firm."

Other firms have evolved slightly more elaborate structures. One firm indicated that "The intra-group liquidity transfers are governed by conventions signed by the General Direction of the firm." Another group stated that "conventions of intra-group fund transfer have been set at regular meetings between regional treasurers and are reviewed on a regular basis."

In some instances, the conventions cover pricing arrangements also. For example, one firm stated that "For liquidity transfers to/from other group companies (abroad), this will be dealt with at an arms-length basis." Another advised that "upon ALM department's proposal, the Group Financial Committee determines, on an annual basis, the internal pricing for liquidity which is enforceable in the whole group."

One firm stood out by the sophisticated nature of its internal structure which it described as follows: "All movements are reviewed and approved by the Compliance, Legal and Tax departments as necessary or required by statute or regulation. Cash movements are administered through Treasury and recorded by Finance. Various agreements, limits and conventions may exist and are understood by all participants. Internal account agreements exist between the dealers and their parents which must be adhered to that reflect these limitations. Treasury also monitors global inter-entity movements of funds as part of its liquidity measurement and management practices at the Parent Bank level."

The agreements and documents are approved at various levels, from "regional treasurers" to "General Direction" to "the Boards of the respective companies."

3. **Does the firm have a diversification strategy for funding sources? If yes, please describe the strategy and any limits on sources such as:**

a. **Maturity**
b. **Counterparty/creditor (banks, multiple types of non-banks)**
c. **Geographical region**
d. **Financial instrument**
e. **Other (please explain)**

Six (approximately 1/3) of the firms interviewed reported having no diversification strategy for funding sources. In all of those cases, this was because they are fully funded by the parent entity. One firm provided the following explanation: "The dealer is not an active solicitor of 3rd party funds and does not maintain its own wholesale deposit taking franchise. All unsecured funding other than retail client deposits are provided by the parent entity through capital, subordinated debt and call loan facilities. The dealer in the USA does make a lesser and occasional use of 3rd party interbank borrowings generally related to short term overdraft needs. This is not a regular permanent source of funding for the dealer. The secured funding practices (repo and security lending) do, however, adhere to actively managed credit risk limitations on counterparty exposures."

One of the firms without a diversification strategy, however, still avoids large concentrations. Thus, it has the following specific limits for short term liabilities:

- *no more than 20% can be borrowed overnight*
- *no more than 30% can be borrowed for up to 1 month*
- *no more than 30% can be borrowed for up to 2 months*
- *no more than 20% can be borrowed for up to 3 months*

Most firms' diversification strategies entail <u>creditor diversification</u> (e.g., insurance companies, mutual funds, banks, corporations, etc.), <u>spreading of debt maturities</u> (e.g., weighted average life of long term debt of approximately 4 years), <u>diversity of funding instruments</u> - secured and unsecured (e.g., use of repurchase agreements, securities lending markets, issuance of long term debt in the public and private markets, use of a variety of short-term funding instruments such as commercial paper, promissory notes, letters of credit, bank loans, direct deposits), and <u>diversity of markets</u> (e.g., U.S., Europe and Asia).

For example, one firm has limits on maturity in order to reduce rollover risk in the long-term debt portfolio. Specifically:

> *Not greater than 8% or $2.7 billion of long term debt maturing in 3 months*
> *Not greater than 14% or $5 billion of long term debt maturing in 6 months*

> *Not greater than 25% or $8 billion of long term debt maturing in 12 months. The firm has increased its long term debt outstanding while simultaneously shifting the average life of the portfolio to a target of 4 years.*

Other firms limited reliance on any particular source by ensuring the diversity of its funding instruments. Specifically:

Treasury borrowing (21%)
Commercial Paper (CP) and other short-term borrowings (3%)
Current Term debt (5%)
Non-Current Term debt (13%)
Bank Deposits (13%)
Secured Funding and Business Unit Funding (61%)

Several firms also have limits on the amount of commercial paper that can be held by any one investor or bank (e.g., one firm limits a single investor to an investment of $500 million and, on the long term debt side, to 5% of the firm's total outstanding debt).

4. Does the firm have a system in place to monitor compliance with this diversification policy in order to maintain broad and diversified credit from numerous creditors? If yes, please elaborate.

Most of the firms with diversification strategies monitor their creditors to ensure compliance with the limits discussed above, particularly on commercial paper and other short term debt. Moreover, one firm regularly reviews each of the banks that form the consortium for its $8 billion line of credit in order to assess its lending reliability during a liquidity crisis. One firm that did not have a system in place at the time of the survey indicated that the "Group's Financial Committee has decided that such a system shall be set up during year 2001."

In terms of responsibility for the function, one firm reports that "The Treasury Department is responsible for monitoring compliance with the policy. A control report which summarizes the cash capital usage and funding position ... is produced once a week and circulated to the CFO and Treasurer." Another allocates responsibility to Risk Management Control while, at a third firm, a "Capital Allocation Committee monitors and authorizes diversification of liquidity sources quarterly."

5. Please describe the credit lines, collateral facilities and funding programs established by the firm, including any intra-group facilities:

Short term (< 1 year)	**% of Total**
____________________*	__________
____________________*	__________
____________________*	__________

Long term (> 1 year) **% of Total**

_________________________* __________

***List as a percentage of the total all committed, uncommitted, secured, and unsecured credit and collateral facilities established by the firm including, for example, commercial paper programs and back-up lines of credit, master securities lending and repurchase arrangements, note issuance facilities, etc.**

The funding of most firms interviewed consists primarily of short term facilities. However, there is great diversity in the structure of available sources. Certain firms rely on their parent company for up to 100% of their funding although in some cases a portion of intra-group facilities is secured. Among the other firms, one reports third party secured sources comprising up to 80% of their facilities while at another this represents only 17% compared to unsecured facilities at 83%. One firm has a relatively balanced mix of 60% unsecured and 40% secured. One firm emphasized that "master security lending agreements are not written to guarantee size of business... (they) are used primarily to establish terms of settlement, margin, rights to distributions of securities exchanged, etc." As such, "counterparties maintain credit exposure limits... that can change and (they) are not privy to those limits." Several firms mentioned that they do not count on committed facilities in a liquidity crisis.

In absolute terms, certain firms reported having committed lines that range from $1-$8 billion (unsecured) (generally a 364 day revolver with a one year term out of all outstandings at expiration), and uncommitted lines that range from $500 million to $16 billion (both secured and unsecured). One firm has a 364 day securities repurchase facility with a one year term out, and another has Letters of Credit worth approximately $10 billion.

Long term sources represent a relatively minor portion of the total amount, with the exception of one firm in which bonds and medium term notes comprise 42.5% and 5.7% of the total respectively, or almost 50%.

Overall, the funding sources mentioned included committed and uncommitted lines of credit (intra-group and third party), overdraft facilities, commercial paper, securities lending and repo, medium term notes, bonds, subordinated debt and equity.

6. Does the firm use ratios or indicators to measure liquidity? If yes, please describe the ratios and their use/interpretation. Does the firm set targets for these ratios/indicators? If yes, please explain.

Four of the firms interviewed do not use ratios or indicators to measure liquidity. One of these, however, indicates that, "following a reflection on the creation of a regulatory liquidity ratio conducted between the industry and the supervisor, (they) will put in place a tool to measure precisely (their) potential liquidity risk."

Two of the firms report that they "do not use internal ratios different from the legal liquidity requirements" in their jurisdiction. However, most firms tend to have their own definition of a "liquidity ratio" in order to enhance its value as a liquidity management tool (customized to fit their individual business practices), but all seek a ratio above 100%. Some of the definitions used by the firms we interviewed included:

- *(cash + borrowing value (BV) of unencumbered securities + unsecured portion of committed facility) / unsecured debt maturing over the next 12 months, including unsecured letters of credit.*

- *(cash + cash equivalents + borrowing value of unencumbered assets + unsecured revolving line of credit) / (unsecured short-term debt + long term debt due in less than 12 months)*

- *loan value of unencumbered assets (i.e., market value x advance rate) / short term unsecured obligations*

One firm reported multiple definitions including:

- *Cash Capital Used < Available Cash Capital, where "cash capital used" is defined as the amount of capital to the extent to which a balance sheet asset is not self-financing in a liquidity crisis, and "available cash capital" is defined as the aggregate of 1) shareholders' equity; 2) borrowing which will not mature in the coming 12 months; 3) the refinancing value of the assets in the balance sheet, and 4) committed unsecured credit lines.*

- *(Total Assets / Shareholders' Equity) < 6*

- *Long Term Debt: Capital < 50%*

- *Short Term Funding Capacity > 25%*

One firm remarked that "Compliance with (SRO) (i.e. Self Regulatory Organization) capital requirements as well as adherence to BIS Risk Adjusted Asset and Asset to Capital ratios at the consolidated () group level control leverage." This was echoed by another firm that referred to "The regulatory environments (that) require early warning excesses... and sufficient capital... to fund margin in the event of a disruption in the ability to acquire unsecured funding."

In terms of setting targets, some firms simply add additional cushions to the regulatory requirements in their jurisdiction. Others set and monitor specific targets. For example, one firm explained that "each major market has got a target to comply with on a monthly basis. This target is set up based on a 1 month liquidity indicator ([Cash in for the month to come + Unhypothecated marketable securities] / Cash out for the month to come)." Most firms interviewed stated that their liquidity ratios are well in excess of 100.

Two firms commented that they generally do not use a liquidity ratio because it estimates the pledge value of unhypothecated marketable securities, and they do not believe that the estimation would hold true in a crisis environment.

With one exception, the firms interviewed do not use the support ratio (see Question 7 for a definition) as a management tool. Two firms criticized the support ratio because it "counts" on unsecured sources, and they do not count on such sources "unless they are drawn."

Firms look at a number of additional ratios or indicators to measure liquidity. These include:

- *long-term capital (debt>1year) and equity and preferred as a percentage of total assets and adjusted assets (=total assets less resale and securities borrowed).*

- *A "barometer" (instead of a liquidity ratio) that is more easily understood (e.g., the barometer would measure the number of days that the firm could survive if it found no new sources of funding).*

- *The "liquidation potential" (how a firm could meet its funding needs in the first 14 days of a stress scenario).*

- *"Positive net cash capital," defined as "long term debt>1year + equity - (firm-wide haircuts + illiquid assets).*

- *A "maximum cumulative outflow" (MCO) standard (determines the amount of short term unsecured funds required to fund cash outflows in a stress event) in order to maintain a funded liquidity cushion.*

"Daily liquidity projections" that analyze and project the liquidity position in the unregulated chain.

7. At the end of the firm's last fiscal year what was the firm's:

$$\textbf{Liquidity Ratio} = \frac{\textbf{Cash + Unhypothecated Marketable Securities (pledge value)}}{\textbf{Short Term Unsecured Funding + Current Portion of Long Term Debt}}$$

$$\textbf{Support Ratio} = \frac{\textbf{Used Capacity}}{\textbf{Available Borrowing Capacity}}$$

Does the firm set targets for these ratios?

The responses varied widely among the firms interviewed, with the support ratio ranging, in fact, from 0% to 100% and the liquidity ratio from 75% to 510%.

The firm reporting a support ratio of 0, a stand-alone securities firm, explained that "the firm's policy is not to draw its credit lines but to save them as a liquidity cushion." On the other hand, the firm reporting a support ratio *of 83-100% is a wholly owned subsidiary of a universal bank and, although the firm offered no explanation in support of the figure, it may be logically assumed to be directly related to the ownership structure and resulting funding system. Support ratios reported by the other firms covered the full range, including 24.5%, 33%, 50%, 60%, and 82%.*

The liquidity ratios were similarly diverse. At the low end, 75%, was a subsidiary of a commercial bank. At the high end, 510% was also a subsidiary of a universal bank. However, this figure was provided in respect of a "sister" firm in the United States and compares with a ratio of only 130% in the home jurisdiction. The firm explained that "liquidity ratios differ substantially due to the form of parent funding mechanisms (short term secured call loans in (the home jurisdiction) versus capital injection in the USA) and the greater ability to utilize secured funding in the US market."

None of the firms interviewed set targets for these ratios, except to acknowledge, in certain cases, that their "ultimate target was that the "support ratio be always inferior to 100%."

8. Does the firm set and regularly review limits on the size of its cash flow mismatches? If so, over what time horizons is the analysis done?

Half of the firms interviewed do not have limits. (One firm commented that, by definition, a liquidity ratio of than 100% eliminates the possibility of a negative cash flow mismatch out twelve months).

Of the firms that do set and review limits on cash flow mismatches, the reviews are performed daily, weekly, monthly or quarterly. The time horizons for their analyses are, for example, "90 days," "one to three months," and "one year." One firm looks at the liability side and picks out a 2 week period and a one year period to reviews. Two firms reported monitoring liquidity cash flows and mismatches in "time bands" or "time buckets" including, "overnight, one week, four weeks and nine weeks."

One firm uses the MCO model, as described above, to analyze the current liquidity position vs anticipated cash outflows over a 90 day time horizon to determine a net cash position 90 days forward. The required cushion is $2 billion.

9. What role, if any, does leverage play in the firm's management of liquidity?

Seven firms responded that leverage plays no role in the firm's management of liquidity. Two others report that "leverage is needed for their daily activity but, since they don't have funding problems from their parents, they do not assess its evolution."

One of the firms acknowledged that "Leverage is a key component in the firm's liquidity management" which they achieve "through debt and with a component of unrealized profit arising from the positions currently run."

Another firm monitors leverage ratios as part of their liquidity strategy and targets a level of no more than 4 - 6 times shareholders' equity.

Some firms have indicated as follows:

- *They measure net (total assets - securities purchased under agreements to re-sell)/total equity), and gross leverage (total assets/total equity) weekly to ensure that the firm operates within a net and gross balance sheet that is consistent with the secured and unsecured funding franchises of the firm*

- *They measure leverage ratios weekly to ensure that the firm's capital structure does not generate liquidity risk.*

One firm provided a comprehensive description of their approach to leverage: "We attempt to employ a prudent amount of leverage permitted under regulatory capital ratios. We generally employ a cushion of capital in excess of regulatory requirements to protect against adverse movements that may impact the ratios. Note also that leverage is generally achieved through the use of secured funding, not through 3rd party unsecured funding. Additionally, to the extent that secured funding sources shrink, we employ intercompany funding as replacement leverage which is not as liquidity risky as 3rd party funding to the dealer and is factored into the parent bank liquidity risk calculations."

10. Does the firm have a particular funding system or strategy in the event of a "liquidity crunch"? If yes, please describe it.

Several firms indicated reliance on the parent entity without any further procedures in place or measures to be taken in the event of a "liquidity crunch." Others limit their strategy to the maintenance of a certain liquidity cushion which is deemed sufficient in the event of market stress.

Some of the firms advised that their strategy would consist of limiting the size of their trading books and liquidating trading assets if necessary.

On the other hand, certain firms interviewed require that they have sufficient liquidity so that they can operate for up to 12 months, even if deprived of any new access to unsecured funds.

One firm has a detailed "Funding Action Plan" that projects potential fund erosion in a crisis situation and forces analysis and management outside of traditional functional levels. A few of the many "key tasks" that need to be completed under the plan within 24 hours include an estimation of the funding requirements for material legal entities, a determination of the maximum pledge value of firm collateral, and preparing cash projections for the holding company's global funding chain.

Another firm has a three scenario "contingency financing plan." In response to a minor crisis, unsecured borrowing is limited (but not prohibited), and *there are daily meetings with the CFO. In response to a significant crisis, new collateral is "repo-ed out" (meaning collateral they are holding for loans that they have made can be used as collateral for the firm to borrow money), and the firm will build cash reserve. The third scenario anticipates a crisis so significant that "no additional borrowing is available." The firm would set up a command centre, and have constant contact with the CFO. However, even under this scenario, the firm would not experience a liquidity crisis because they will have established sufficient funding to continue to operate for one year without new funding sources.*

11. What internal systems and audit or other controls does the firm use to measure and monitor liquidity? Do these systems account for the impact of foreign exchange movements on the firm's positions and the interest rate sensitivity of its asset and liability positions?

With one exception, all the firms have developed internal systems to measure and monitor liquidity. Only one firm reports having a "basic firm control system (with) no separate treasury system."

Most firms are concerned with eliminating foreign exchange exposure which the firms reported doing through matched currency financing or by hedging via forward or swap markets. One of those firms stated that foreign exchange risk arising from a given business unit's activities is managed at the business unit level within the existing market risk limit structure.

Interest rate risk is generally not felt to be problematic as most of the assets and liabilities are short term and several firms report not evaluating interest rate risk for this reason. Two firms report that "Interest rate movements are neutral" because, in one case "any supplementary cost due to interest rate movements is entirely charged against the intra group counterparts" and, in the other case, the firm "does no transformation, hence is not exposed to a global interest rate risk."

The Treasury Managers and the CFO are primarily responsible for monitoring liquidity with Risk Management Departments and both internal and external auditors responsible for internal controls. Firms use ledger balances (supplemented with spread sheet analysis), loans and placement systems, trading systems, MCO and Cash Capital models, daily liquidity positions, and reconciliation of data and aggregate balances to the firm's financial accounting and/or regulatory reports. One firm relies on reports provided by the back office systems to measure its liquidity needs.

Four of the firms said that they use VaR models to account for their corporate foreign exchange exposure and treasury interest rate exposure (one of those firms stated that the VaR model applied to interest rate exposure on the firm's unsecured debt portfolio net of swaps).

12. If the firm uses Value-at-Risk as a risk management tool, does the firm's model currently incorporate adjustments for liquidity factors? If yes,

please elaborate. If no, is the firm considering incorporating adjustments for liquidity factors within the next 12 months?

Five of the firms do not use VaR as a risk management tool. One firm explained that VaR models are not yet used in their jurisdiction for prudential purposes but that "there is regulation in progress in this respect."

All of the other firms use VaR to some degree but most models do not account for liquidity factors. Some firms consider that the nature of their business is such that the risk is not deemed material (i.e. given the asset/liability structure and the level of secured funding, or the fact that, as a broker, their positions are matched with client positions). Similarly, another firm considers that "its trading positions are relatively small and it can control trading position by the cash capital usage."

One firm indicated that it "uses Value-at-Risk as a limits monitoring and capital allocation tool. The Value-at-Risk framework is used to manage an "extended" market risk which includes the effect of credit spread volatility on corporate bond issues. The firm is working to extend further the Market VaR to incorporate adjustments for liquidity factors (basically the volatility of the bid-ask spread)."

13. How often is the firm's liquidity position measured and reported? To whom is this information reported?

Almost all firms measure their liquidity positions daily. One firm reports that the cash capital usage report is performed weekly, or daily in adverse market conditions. One firm looks at it monthly, and then on an ad hoc basis. However, they are in the process of implementing a new, internet-based system that will do this daily. Another firm formally measures and reports it monthly, but tracks it more frequently.

In terms of reporting, the frequency varies depending on who the report is being provided to. Weekly reports are provided in some cases to Corporate Treasury, a Managing Director, a Group Treasurer or an Executive Board. Quarterly reports are provided to the parent company in one case and the Financial Committee in another case. One firm also indicated that they report their liquidity position to the Rating agencies on a quarterly basis.

14. Does the firm measure contingent commitments when calculating funding/liquidity risk and requirements (for example, back-up lines of credit for commercial paper)? If yes, please explain the methodology.

A majority of the firms do not measure contingent commitments when calculating funding/liquidity requirements. One firm explained that "As per the absence of a wholesale deposit or loan franchise in the dealers, and reliance on inter company funding, the dealers do not incur contingent credit commitments of any material amount." However, it adds that "The parent bank global liquidity processes do incorporate any contingent events *emanating from the dealers' practices and factor those into its planning considerations."*

Another firm indicated that this is "Only done at a global level, as lines are organized globally. This is reported in the credit facilities and utilization summary."

Seven of the firms interviewed stated that they do measure contingent commitments. According to one firm, for example, "The Treasurer and the various Desk Risk Managers jointly perform a monthly estimate of contingent liability requirements by analyzing the firm's trading positions under various market scenarios. Stress analysis is applied to evaluate potential cash requirements arising from early termination, collateral, and other credit provisions normally found in the firm's derivative contracts."

One firm stated that its commitments are cash capitalized based on the viability of the exit strategy in a crisis and on the probability of occurrence, and are measured and reported on a weekly basis. Another stated that it reviews its net cash capital position/target cushion. In general, these firms appear to consider the probability of "draw-down," the on-balance sheet asset equivalent per legal entity, and pre-funding requirements.

15. Does the system take account of cash flows from derivative positions (such as swaps) and potential cash flows from derivative positions (such as options and knock-in swaps)? If yes, please briefly explain the methodology.

Many of the firms interviewed do not hold OTC derivative positions and therefore the question does not apply. Some of the firms consider that "these products generate a risk which (in their case is) negligible compared to the liquidity impacts issued by cash and securities activities." Another holds primarily exchange-traded contracts which are marked to market daily.

One firm reported that a 100% haircut is applied to the NPV (net present value) of future cash flows related to derivative positions. Using a similar approach, another firm indicated that "The net mark to market value of derivative positions are subject to margin haircut in the respective capital calculations."

One firm stood out with a carefully considered system as they explained that "throughout the last decade, they carefully observed the liquidity risks related to the financial derivatives and have developed some in-house rules and practices to evaluate the derivatives in a proper and conservative manner. For example, the low liquidity of options on individual stock in (their jurisdiction) disallows them to apply implied volatility in evaluating their OTC option positions on the same underlying stock, instead requiring them to estimate the volatility based on historical data. Due to the low liquidity of these options, they have adopted the "mark-down" rule for some long OTC options. Under the rule, they prepare two volatility numbers; one is a historical-based volatility number (the original one) and the other is a lower volatility number *marked-down following a particular procedure (marked-down one). For each option on individual stock, the rule requires them to use one of these volatility numbers that gives a smaller present value."*

16. Does the firm apply "haircuts" to assets when calculating the liquidity of the firm's balance sheet? Please explain the haircut methodology for each type of security.

Six or one third of the firms interviewed stated that they do not apply haircuts.

Among those that do apply haircuts, as one firm indicated, they are "based on asset quality and detailed security classification." One firm applies haircuts to equities based on the underlying activity, that is, whether the security is held for equity arbitrage, proprietary trading, etc.

Another firm applies the following hair cuts based on types of security:

-	*Government bonds*	*5%*
-	*Highly liquid mortgage backed security*	*10%*
-	*Prime CPs*	*5%*
-	*Listed equities*	*30%*
-	*Bank debt*	*15%*
-	*Corporate debt*	*20%*
-	*Money market instruments*	*5%*

17. Does the firm apply "haircuts" to collateral received from customers, in particular, when calculating the liquidity of the firm's balance sheet? Please explain the haircut methodology for each type of security.

All of the firms interviewed apply haircuts to collateral received from customers. As one firm explained, "Haircuts are established for two main reasons: a) to provide protection against bad debt and, b) to provide ample margin so that the firm can re-hypothecate the securities if necessary."

The haircut ratios are determined in some instances by a Credit Department but may also result from guidelines emanating from a supervisory authority such as the US Federal Reserve or a self-regulatory organization. For example, one firm noted that "Under regulatory guidelines, procedures and systems ensure that the dealer secures sufficient collateral from clients on the day's closing market value of outstanding positions and collateral for margin loans and short sales." Another firm simply applies haircuts to client collateral "on the same basis as brokers charge (them)."

Margin ratios are determined per type of security. One firm noted that collateral other than securities would be considered on a case-by-case basis. Firms consider a combination of factors in determining the haircut rates, including refinancing capability of the collateral, liquidity and price volatility, and credit profile of the clients. Indeed, some firms haircut the value of collateral to "0" for certain customers to take account of local legislation.

One firm commented that they consider haircuts in a financing trade (in deciding e.g., the value of stock as collateral) but not in a derivatives transaction. They stated that it is more conservative not to consider the haircut in connection with a derivatives transaction because derivatives are off the balance sheet. (N.B. the accounting rules in this jurisdiction have recently been changed and this statement is no longer true).

18. Does the firm perform back-testing, stress-testing and/or scenario analysis to assess the strength of the firm's liquidity position? Please provide details including frequency of testing, assumptions and personnel responsible.

Most firms interviewed do not perform back-testing, stress-testing or scenario analysis to assess the strength of the firm's liquidity position. Four of the firms neither back test nor stress test but these all perform scenario analysis in order to assess the impact of a liquidity crisis on the firm's funding posture. These firms stated that haircuts on asset values, the liquidity ratio and/or VaR models are intended to take account of any stress situation.

Similarly, some of the firms consider other existing measures to adequately account for potential liquidity risks and that further analysis is unnecessary. For example, one firm asserted that "effectively the next day daily measure of capital compliance attests to the effectiveness of existing daily control processes" while another explained that "The daily haircuts used are conservative and based on the experience of difficult market conditions in the past. E.g., Emerging markets crisis. These haircuts are supported by long term debt and equity. This conservative approach negates the need for stress testing/scenario analysis."

One firm simply examined its maximum and minimum funding requirements over the last year while another specified that while it does not perform any of the tests itself, the parent entity "does undertake scenario analysis on a consolidated basis." A third firm was developing different stress testing scenarios for the 2001 plan for liquidity management.

On the other hand, some firms have developed more comprehensive testing processes. One firm reported that they perform scenario analysis on a weekly basis and another that they do a twice-a-year "drill" to test the scenarios. A third firm "tests the worst case scenario analysis, what happens to liquidity sources (how each liquidity provider acts) if changes in the financial markets happen, the credit status of the firm changes, etc." The Treasury Department at that firm also practices stress testing twice a year but has not performed back testing. They noted that the stress testing examines maximum cash outflow and available liquidity sources within a certain time horizon.

Another firm performs "stress testing and funding simulations taking into account funding difficulties in the event of a crisis affecting short-term money markets. The simulations show cash and collateral surplus in cases that each product line cannot reduce the assets by trading. These results are reported at the Risk Management meeting."

Finally, one firm stated that its MCO model is calculated weekly and stress-tested to assess the strength of the firm's liquidity position in a crisis environment. In addition, it back-tests its treasury's VaR models for corporate foreign exchange exposure and its treasury's interest rate exposure on unsecured debt (net of swaps).

19. When calculating available cash resources for the purposes of stress testing, what resources are included (i.e. unhypothecated marketable securities, committed and uncommitted lines of credit, etc.)? Are these resources weighted based on their degree of liquidity similar to applying haircuts?

Those firms that do perform stress testing indicated including the following resources for the purposes of stress testing:

- *cash, deposits, highly liquid assets (unencumbered treasury bills, government bonds) and committed credit facilities. However, haircuts are not applied here.*
- *available cash resources, overdraft / loan lines from banks and intra-group loans. These are not weighted based on their degree of liquidity.*

One firm described conducting a simulation using 3 scenarios: 1) where funding by repos, general collateral or commercial paper is entirely impossible, where it is 50% possible, and where it is 75% possible.

Another firm explained that the testing and planning exercises are performed at the parent bank level under conservative disposition assumptions on unhypothecated assets. The parent bank considers it more conservative to eliminate altogether certain types of assets from liquidity calculations such as non-readily encashable assets, versus applying a haircut value.

20. When assessing the adequacy of the firm's liquidity position, does the firm consider a particular "benchmark" period of time during which the firm must be able to meet or exceed its funding obligations?

Eight, or almost 50%, of the firms interviewed do not consider a particular "benchmark" period of time when assessing the adequacy of the firm's liquidity position.

One firm has a benchmark of one week, 3 firms of 90 days, 1 of 180 days and three firms have a benchmark of one year (assuming that unsecured funding dries up).

Several firms measure the liquidity position at multiple time horizons, for example, 7 and 30 days, or 1 month and 6 months.

IV. Sources of Liquidity

1. **Please describe the sources of liquidity at the firm at the end of the firm's last fiscal year, as follows:**

Types of Short Term Instruments (< 1 year):	**% of Total**
Cash	________
Unhypothecated marketable securities (T-bills, etc)	________
Commercial paper issued	________
Bank Loans, Promissory Notes, Fed Funds	________
Repurchase Agreements	________
Securities Lending Agreements	________
Lines of Credit (Committed Facilities)	________
Intra-group Funding	________
Other (please specify if >5%)	________

Types of Long Term Instruments (> 1 year):	**% of Total**
Secured, to mature in < 1 year	________
- indicate types of instrument	________
Unsecured, to mature in < 1 year	________
- indicate types of instrument	________
Secured, to mature in > 1 year	________
- indicate types of instrument	________
Unsecured, to mature in > 1 year	________
- indicate types of instrument	________

Intercompany funding played a significant role at several firm representing up to 100% of all funding sources. Some of the other results were 2%, 11%, 11%, 45.4%, 46.2%, 94%, and 99%. On the other hand, several other firms reported 0%.

The most prevalent source of liquidity, observed even at firms with access to intercompany funding, is repurchase and securities lending agreements. It comprised a significant portion of funding sources at several firms representing, for example, 11%, 24.8%, 33%, 62%, 65.1%, 80% and 83.7% of the totals.

Bank loans and commercial paper were of relatively minor importance at all but four firms who reported relying on these sources for 17%, 40.9%, 62% and 62% of their funding respectively.

Cash accounted for 29% of funding sources at one firm but represented only 5%, 6.3% and 7.9% at other firms.

Several firms reported no long term funding at all. Among those responding affirmatively, most received the funding from a parent entity. The firms *mentioned, for example, subordinated loans, "intercompany capital," equity and bonds as the instruments used.*

V. Capital Adequacy and Regulatory Requirements

1. a. Are there regulatory requirements regarding the management of liquidity risk in the jurisdiction(s) in which the firm operates?

One firm responded that there are no regulatory requirements in their jurisdiction regarding the management of liquidity risk. One jurisdiction noted that there are regulatory requirements for banks but not for securities firms so far. However, they added that a recent Financial Activity Modernization Act "laid down the principle of a management rule relating to liquidity in securities firms." This led to the creation of a working group comprised of members of the supervisory authority and of securities firms which has agreed to two complementary approaches: one prescribing rules relative to internal controls, and another more quantitatively oriented. Work on these regulation projects is still ongoing.

In general, though, the focus of regulation for securities firms is on capital requirements that incorporate implicitly asset liquidity in determining the relevant capital charge. Additionally, those firms that are members of a banking group are indirectly subject to the liquidity rules applicable to banks.

b. If the firm is a member of a group, are there any regulatory or legal requirements or restrictions that might affect the group's ability to transfer liquidity between entities? If yes, please explain.

Six firms were not aware of any restrictions that might affect the group's ability to transfer liquidity between entities.

One firm commented that the only restrictions in its jurisdiction are on the ability of a subsidiary to buy its holding company shares.

However, there are restrictions in several jurisdictions relative to the inclusion of inter-company funds in the liquidity ratio or in the calculation of assets. One firm specified that sources from foreign entities may not be included. Another commented that receivables from group companies tend not to be recognized as assets under local rules and, therefore, a firm cannot transfer liquidity between entities to the extent that it will result in non-compliance with (capital rules)." A third firm noted that "Short-term lending and other measures supplying funds from the firm to its group companies are to be included in calculating counterparty risk, which affects the capital adequacy ratio. Thus, the transfer will be limited to the extent to which the firm maintains an adequate level of capital adequacy ratio."

Other firms are restricted by hard limits (% of financial resources) on balances with connected companies. One such firm specified that "Uncollateralized debtors or cash deposited with an affiliate is classed as non-trading book and is therefore subject to these limits."

Finally, one firm stated that legislation emanating from the self-regulatory organization of which it is a member limits the dealer from lending to the bank parent as there is a concentration test on holdings and dealings with a parent entity. Any such dealings incur a 100% capital penalty. The firm explained that "This is to ensure that the dealer can stand on its own and is not overly exposed to the parent." It was also pointed out that, in one jurisdiction, federal legislation prevents a dealer from dealing with the global parent bank or its branches on an uncollateralized basis.

c. What information, if any, relating to the firm's liquidity position/strategy does the firm provide to its supervisory authority(ies)?

Here is a sample of the information relating to their liquidity positions provided by the firms to the supervisory authorities:

- *credit facility summary*
- *monthly Financial Report and Audited Annual Joint Regulatory Financial Questionnaire and Report (which demonstrates the regulatory capital calculation).*
- *Focus Report including the ratio information and other financial and operational information.*
- *Due to and due from banks, amount of available credit lines, amount of pledges issued and received, details of intercompany accounts.*
- *A Liquidity Statement reporting on the compliance with and calculation of the legally required liquidity ratio.*
- *Cash liquidity ratios.*
- *Liquidity ratios of which a "Liquidity Coefficient" built as a scenario of outflows and inflows under a one month horizon ((short term liabilities + own funds) / (cash + liquid assets)) >= 100%, and three "Observation Ratios" under respectively a three, six and twelve month horizon plus a Long Term Mismatch Ratio ((equity + long term resources) / (long term assets)) >= 60%*
- *Liquidity adjustment split between non-trading book and illiquid.*

d. How often does the firm provide this information and in what form?

Most firms interviewed indicated that supervisors require monthly reports.

Three firms file their reports quarterly. Two of the reports mentioned are required annually, the Long Term Mismatch Ratio and the Joint Regulatory Financial Questionnaire and Report. Additionally, several firms also commented that they are subject to requests for information and on-site inspections at any time. One of these firms noted that on-site inspections are conducted at a minimum every 3 years. Similarly, other firms specified that, although they file reports monthly, they are required to be in compliance with capital ratios, for example, at all times.

One firm is "required to forthwith notify (the supervisory authority) where 1) aggregate bank borrowings exceed total limits on such facilities; 2) the firm has been unable to meet calls or demands for payment by any lender for 3 consecutive business days; or 3) any lender has exercised its right to liquidate the firm's security in order to reduce the borrowing."

At least six firms, or 1/3 of those interviewed, file reports electronically.

e. If relevant, please indicate the firm's most recent regulatory capital ratios.

All firms interviewed reported ratios well in excess of the required levels. Some firms provided absolute amounts of "liquidity surplus" (i.e. after complying with the liquidity ratio).

Other firms reported the following percentages in excess of required levels: 93%, 18.51%, 26%.

Others provided regulatory capital ratios of 387.8% and 562.5%.

Two firms indicated BIS capital adequacy ratios of 13.2% and 8.9% (tier 1 capital ratio). One firm noted, however, that this is not a good indicator of liquidity.

2. Does the firm maintain a cushion of liquid capital to meet immediate needs during adverse conditions? If yes, how much (%)? How is this amount calculated? If the firm is a member of a group, in what entity is the cushion maintained?

Most firms maintain a "cushion" to meet immediate needs during adverse conditions but not always in the form of liquid capital at hand. Several firms referred either to capital requirements generally or, more specifically, funding cushions of unused credit lines or the ability to liquidate securities.

One firm maintains a multi-billion dollar "lock box" of cash stored at a bank. Several others indicated that they maintain a "cushion" by making sure that their long-term debt, preferred stock and common equity provides liquidity in excess of the needs of haircuts, long term investments, fixed/other assets and goodwill (e.g. having a liquidity ratio above 100 and maintaining positive Net Cash Capital). One firm stated that its MCO standard (liquidity position in a crisis) is to maintain a funded liquidity cushion of $2 billion, 90 days forward. That firm's Cash Capital Standard (long term unsecured sources required to fund long-term unsecured funding needs) is to maintain a funded liquidity cushion of $1 billion).

At these firms, in terms of accounting for liquidity in the capital structure, the concept of surplus cash capital and its usage in the management of liquidity risk is the driver of the firm's total capital. Total capital less the current portion of long term debt is the amount of cash capital that the firm has to cover firm-wide haircuts and illiquid assets. As such, changes in the liquidity *risk characteristics of the firm's asset base are a critical determinant in the firm's total capital level.*

VI. Firm Experience

1. Has the firm experienced significant stress on its liquidity in the past 3 years? If yes, has this stress (or other events in the financial markets over the past several years) caused the firm to change its funding and liquidity policy or otherwise resulted in closer attention? Please explain.

Eight firms, or almost half of those interviewed, acknowledged that they have experienced some stress in their liquidity positions either in the fall of 1998 or due to other recent market events. One firm stated that it developed minor difficulties in selling its term paper. Another noted that it failed one of the Early Warning tests related to profitability as the result of a large trading loss sustained during the month of October 1998.

As a result, these firms took the following actions:

<u>Firm 1</u>

This firm instituted a new "funding framework policy" to improve its management of liquidity risk. It became firm policy to:

- *eliminate the need to reduce or sell assets for liquidity reasons*
- *price the cost of liquidity into customer transactions commensurate with liquidity risk (no subsidies).*
- *integrate both unsecured and secured funding strategies to ensure that the firm operates with a term structure of liabilities that is matched to the liquidity risk of the assets being financed*
- *operate the firm with the appropriate level of financial resources*
- *operate businesses within allocated limits, i.e., institutionalize a "limit" culture as a "hard" restraint on division operations*
- *institutionalize MCO and Cash Capital standards and a "maximum to be funded" quantity (representing a completely reliable secured funding capacity available by product in a crisis environment).*

<u>Firm 2</u>

- *established a $7 billion liquidity portfolio*
- *imposed additional limits on funding for certain business lines*
- *instituted policy changes as to what business lines can do and to their risk limits*
- *improved the firm's one year financial profile and its asset mix (e.g., more 1 year debt, less commercial paper and other short term borrowings)*

<u>Firm 3</u>

- *The parent entity increased the capitalization of the dealer to more effectively deal with any profitability or liquidity issues.*
- *A sister subsidiary abroad increased its regulatory capital base by increasing subordinated debt to cover a large volume of underwritings and increases in certain types of inventory that are capital intensive.*

Firm 4

- *Took several actions and changed funding strategies such as increasing committed credit facilities, setting maximum cumulative cash flow.*

Firm 5

- *Stopped maintaining excessive assets and revised the client agreement so that it could collect interest as the Inter-bank offered rate rather than just the Prime Rate.*

Another firm reported that funding and liquidity policies were not substantially amended as the stress on their liquidity was not considered significant.

Similarly, another firm stated that it did not experience particular problems but, nonetheless, after the fall of 1998, increased its liquidity risk cushion account by $8 billion.

Lastly, one firm reported that they were able to deal with the events successfully and have therefore not changed the funding and liquidity policies. However, their response from a strategic standpoint was to "increase the size of Class A holdings and extend the term of repos and CPs over the crisis date."

2. What are the firm's current short-term and long-term credit ratings? (Moody's, S&P, etc.) How has the firm's access to capital and overall liquidity been affected by changes in the firm's credit rating and vice versa? Do creditors require the firm to maintain certain liquidity or other ratios?

Half of the firms do not have independent ratings. Those firms that are members of a group rely for the most part on the rating of the parent entity. As one firm stated: "The dealers are not rated as they have no external borrowing requirements outside the parent. Creditors generally look o the parent's credit rating." The parents are generally of high quality.

One firm commented that "most operations in the Asian regions are not (rated) by firms (such as) Moody's or Standard and Poors. However, the firm has its own guidelines which are well known to its major creditor banks."

One firm noted a slight improvement in access to capital reflecting the improved ratings picture for the holding company over the past 4 years. On *the other hand, another firm reported having been downgraded by S&P from A+ to A but this had no tangible consequences for the firm. It also mentioned that it will "soon by rated by Moody's as well, which is seen as a good point, some creditors being more comfortable with a double rating."*

3. What kind of cross-border issues are raised in the context of liquidity management (e.g. longer settlement periods in certain markets or gaps between settlement dates, lack of a securities lending or repo market)? How does the firm address them?

The focus of the responses was settlement issues such as non-standard settlement periods and time zone differences.

Several firms address cross-border issues by limiting overseas dealings or by avoiding transactions in non-liquid markets and / or non-liquid instruments.

Another firm described their strategy for addressing non-standard settlement periods as follows: "Where settlement requires that collateral is temporarily unavailable, this is financed via the commercial paper program. Where there is no securities lending or repo market, then assets will be financed from long-term debt (> 1 year) and equity."

Finally, one firm offered the following comprehensive discussion of its cross-border issues:

"The dealers (in the group) are country specific and their practices are thus somewhat limited to one national jurisdiction (in each case), thus mitigating this comment (i.e. funding, client and investment practices stay within the jurisdiction).

The parent bank does, however, recognize differences in different markets particularly with respect to depth of securities and securities lending markets and factors these into the evaluated liquidity of the dealers at the parent bank level. These market factors also explain different asset composition as well as funding mixes in each dealer. In (the home jurisdiction) where securities markets are weaker, less reliance is pursued on secured lending and intercompany funding is more prevalent. (Abroad), however, where client free credits are not available to the dealer as a source of funding, more capita and sub-debt is injected. Awareness, communication and coordination with repo and security lending desks and capital and asset planning exercises, and limits provide multiple mechanisms to changing collateralized funding capacity in each dealer.

Differing regulatory environments also limit the type and amount of intercompany funding that can take place between the dealer and its parent. Adequate funding cushions in both capital and unused secured funding capacity are determined and maintained to limit daily inter-entity funding needs as mentioned. This also has an opposite effect of trapping parent liquidity in the dealer as well. The dealers are limited from lending unsecured *excess funds back to the parent in both the home jurisdiction and abroad subject to capital penalties."*

4. Are there other important elements in managing the firm's liquidity risk that have not been discussed in the previous answers? If yes, please describe.

Two firms cited their reliance on customer cash and margin account deposits, or on the stability of retail deposits as being areas of potential weakness. In one case, due to the relative stability of these assets over the years, they are treated as "core" balances for liquidity management purposes. In the other case, a main part of the liquidity is provided by the stability of retail deposits at the parent bank.

One firm stated that it does not, as a matter of policy, lend to unregulated affiliates. Those affiliates must find alternative sources of funding. Because of this policy, business dealings with unregulated affiliates must be approved by a high level official.

Another firm expressed the desire that their jurisdiction relax the ways securities dealers can deal with client securities held as collateral and deposit money with non-bank financial institutions.