THE PAYMENTS RISK COMMITTEE[1]

FINANCIAL MARKET INFRASTRUCTURE RISK

Current Report of the Financial Market Infrastructure Risk Task Force[2]

New York

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[1] Sponsored by the Federal Reserve Bank of New York, the Payments Risk Committee is a private sector group that includes senior managers from several major banks in the United States. The Committee identifies and analyzes issues of mutual interest related to risk in payment and settlement systems. Where appropriate, the Committee seeks to foster broader industry awareness and discussion and to develop input on public and private sector initiatives. Current members of the Committee are Bank of America, The Bank of New York, Bank of Tokyo-Mitsubishi UFJ, Citibank, Deutsche Bank, HSBC Bank USA, JPMorgan Chase, State Street Bank and Trust Company, UBS, Wachovia, and Wells Fargo.

[2] As noted on page 12 of the report, this is considered a "living" document. It should be expected that over time this report will be revised to incorporate industry feedback.

1. Preface

The Federal Reserve Bank of New York established the Payments Risk Committee in 1993 to serve as a channel of communication between commercial bankers and the Federal Reserve System, with the goal of formulating recommendations to improve the quality of risk management in payment and securities settlement systems. Senior executives with broad payments systems experience from banks that were active in the payments business were invited to participate in the Committee. In addition to its primary role of formulating risk reduction recommendations, the Committee's objectives are to promote better understanding of payments risk issues among market participants; to enhance knowledge of the payments systems infrastructure in the United States and abroad; to circulate research on payment systems to participants and the public; to promote better communication between private sector institutions, the Federal Reserve Bank, and, where appropriate, other bank supervisors within the United States and abroad; and to provide a forum for the discussion of technical issues pertaining to payments systems.

The Committee is sponsored by the Federal Reserve Bank of New York and is composed of representatives from Bank of America, The Bank of New York, the Bank of Tokyo-Mitsubishi UFJ, Citibank, Deutsche Bank, HSBC Bank USA, JPMorgan Chase, State Street Bank and Trust Company, UBS, Wachovia, and Wells Fargo. In addition, staff from the Board of Governors of the Federal Reserve System participate in the Committee's efforts. The Committee is supported by a Working Group of mid-level executives that conducts research on topics designated by the Committee and drafts reports and studies for Committee approval.

1.1. The Working Group and the Financial Market Infrastructure Risk Task Force

In late 2005, the Committee requested that the Working Group undertake a study of how global banks assess, measure and manage the risks associated with participating in systems handling payments, clearing and settlement (including both cash and futures instruments) in the U.S. and around the world.

In February 2006, the Payments Risk Committee assembled a Task Force of representatives from global banks (see Appendix 1) to undertake a survey of how their banks monitor activities conducted with exchanges, clearinghouses, payments systems and depositories and focus on the risks associated with direct participation in these systems.

The Task Force was requested to prepare a report on the results of the survey which asked questions such as:

- Have risk polices been established at the bank governing participation in clearing and settlement systems?
- Which of the associated risks are identified and assessed at the bank, and how are the risks qualified?
- Who within the organization is responsible for assessing and approving the risks?
- Are techniques used to measure any of the risks?

- How frequently are risk assessments conducted?
- Are risks reported to senior management for review or approval?
- What processes are in place to monitor the on-going risks and exposures?
- Are credit-related exposures to clearing and settlement networks incorporated in the bank's credit systems?
- Does the bank take efforts to limit, manage or mitigate any of these risks?
- Are there any regulatory requirements imposed on the bank to manage these risks?
- How does the bank prescribe economic capital against any of these risks?

1.2. Acknowledgements

Valuable guidance and support were provided by members of the Payments Risk Committee and the Working Group.

The conclusions and recommendations set forth in this report do not necessarily represent the policies of the institutions represented or the policies or views of the Federal Reserve System.

2. Executive Summary

This report presents an overview of the risks that financial institutions take as members, users, or participants in Financial Market Infrastructures (FMIs). FMI systems can include exchanges (both cash and futures/options), clearinghouses, securities depositories, and payment systems.

Global banks are critically reliant on financial infrastructure networks to support their core payments, trading, clearing and custody activities. The structure and operations of these systems can greatly impact the risks banks take with respect to counterparties and clients. Participating in FMIs can expose banks to various and potentially significant risks. Many of the risks are difficult to limit and manage, as they are "conditional" upon membership.

While banks have been participating in FMIs for decades, it is not clear how the associated risks are currently being assessed by banks, and whether risk management practices are similar or widely differ. There is little guidance by the regulatory community in this risk area, and regulation is either unclear or uneven across jurisdictions. This is at a time when the risks to financial infrastructure systems are growing for various reasons. These include (1) a rapid increase in transaction volumes, (2) the concentration risks associated with the increase of central counterpary (CCP) clearinghouses, (3) the widespread adoption of loss-mutualization provisions, and (4) a potential increase in the risk profile of networks as they become for-profit, publicly traded companies, beholden to shareholders as opposed to member banks or financial institutions.

The objective of the FMI Risk Task Force has been to survey how global banks currently assess, measure and manage the risks associated with participating in FMIs in the U.S. and around the world. The Task Force prepared a survey questionnaire that each of the participating banks completed (see Appendix 2). The scope of the survey questionnaire covered each institution's direct participations with FMIs. The types of relationships covered in the survey included:

- Trading memberships at securities exchanges (e.g., London Stock Exchange, Tokyo Stock Exchange, Swiss Exchange) and derivatives exchanges (e.g., Eurex, Chicago Mercantile Exchange)
- Clearing memberships at securities clearinghouses (e.g., National Securities Clearing Corporation, Japan Securities Clearing Corporation)
- Clearing memberships at derivatives clearinghouses (e.g., LCH.Clearnet, CME Clearing House, Hong Kong Securities Clearing Company)
- Memberships at securities depositories and settlement systems (e.g., Depository Trust Company, CREST)
- Direct participations in payment systems such as large-value funds transfer systems (e.g., CHIPS, Euro1)

This report summarizes the results of the survey setting out how banks characterize the risks associated with FMIs, and how they are currently measuring, managing and mitigating the risks. With the survey results, the Task Force met and developed 10 recommendations on sound risk management practices for banks to consider and apply as appropriate for their institution.

3. Overview of the Risks

There is a broad spectrum of risks that arise from membership in FMIs. Based on the survey responses, this section elaborates and defines these FMI related risks.

3.1. Credit Risk/Membership Risk

Credit risk with respect to FMI relationships arises in a number of ways. It exists when banks are contractually obligated to financially support the FMI in the event another member defaults. In some cases there are mutualization provisions so that a bank will have to cover the losses of another member(s). Credit risk also arises when a clearinghouse serves as a CCP or guarantor of trades, replacing bilateral counterparties as the principal to transactions that take place in the market. This risk includes membership obligations requiring members to cover losses incurred by the network, or to assume certain liabilities for actions or omissions of the network, another member, or third parties.

3.2. Legal Risk

The legal risks associated with participation in FMIs include the risks inherent in the underlying legal environment in which the FMI operates, contractual obligations that exist for members based on agreements they enter into with the FMI, and the rules and procedures that govern the operations of the FMI. More specifically, the legal risks include the nature of the legal relationship with the FMI, structural liabilities that may exist for members, finality provisions in the FMI rules and the underlying law, consequential damages provisions, indemnification requirements, FMI insolvency, litigation risks, governing rules, netting provisions and enforceability, unwinding provisions, enforcement of collateral, loss sharing, maximum legal liability, and regulatory oversight.

Legal risk exists when undue legal liabilities/obligations are imposed on participants (i.e., indemnifications, third party liability, indirect or “consequential damages”) or the underlying legal system may not sufficiently support the role and activities of the clearing or settlement system (i.e., lack of enforceability of netting, finality, collateral, or novation/assignment provisions).

3.3. Market Risk

This risk occurs when FMIs fail to manage their market risks with respect to collateral, handling of margining procedures, etc. Extensive market moves and volatility can have a negative impact on an FMI and thereby create a credit event for the FMI.

3.4. Operational/Technology/Security Risk

This is loss from inadequate or failed internal processes, people and systems or from external events. For example, operational or technology risk arise because of a system failure or disruption, acts to defraud or misappropriate property, or unintentional or negligent failure by the

FMI system operator to meet fiduciary and suitability obligations. This risk can include faulty contingency planning, inability to recover from outages, compromise in data security, and software or hardware issues. There is also risk that an operational or technology failure at the member level could spill over and have a negative impact on the FMI. There is also the risk of data security being compromised, lost, or stolen, and the risk of loss due to the lack of physical security on the premises of a FMI.

3.5. Compliance Risk (Regulatory)

This is the risk associated with any failure to comply with regulatory requirements in a timely manner. In some jurisdictions there are multiple regulatory requirements that impact FMI participation, and in other jurisdictions, very few or none. In the U.S., for example, respondents cited several regulations that may impact their relationships with FMIs. They include;

- BC-235 (OCC)
- National Banking Law 12.C.F.R Section 28.3 (c) (OCC)
- Futures Commission Merchant Regs (OCC)
- Regulation Y (Federal Reserve)
- Regulation K (Federal Reserve)
- 17 (f) 7 (SEC)
- Payment System Risk Policy (Federal Reserve)
- Regulation K (Federal Reserve) Section 211.10 (a) (18) 5 (d) (17) (ii)
- Sarbanes Oxley S404

3.6. Liquidity Risk

This is the risk that the FMI will not have sufficient safeguards/liquidity mechanisms in place to ensure settlement. Liquidity risk can be caused by a credit risk event, “gridlock” in large-value systems, a series of failed transactions, the reversal or unwinding of transactions, problems with linkages to other networks, and the inability of the FMI to manage liquidity in the system. An example would be the lack of access to liquidity by member/participants in a RTGS payment system.

3.7. Clearing Bank/Settlement Bank Risk

The risks are associated with having to place financial assets (i.e., cash) with a designated commercial bank(s). The risk could stem from credit or operational problems of the clearing bank or settlement bank.

3.8. Reputation or Franchise Risk

This is a risk that may arise if a membership is resigned due to the risk concerns of a member. If a membership is resigned, it could result in negative publicity for the financial institution resigning or have an impact on the institution’s reputation in the market or with customers. Franchise or reputation risk can also arise if a financial institution holds a significant equity stake in an FMI, and the FMI experiences operational or financial problems.

3.9. Financial Risk

Risk of the FMI experiencing financial difficulties that would impact its ability to operate and manage the system. There is also the risk of loss of an equity ownership stake if a FMI goes bankrupt.

3.10. Customer Credit Related Risk

This risk deals with controlling customer limits and exposures, know-your-customer, anti-money laundering, margin posted on behalf of clients, and rules forcing a bank to settle on behalf of clients. The structure and operations of financial infrastructure systems can greatly impact the risks banks take to other counterparties and clients. For instance, whether a settlement system provides for delivery-versus-payment (DVP) settlement will determine if banks assume full settlement (principal) risk for trading activities, or merely a pre-settlement (market price) risk. In addition, the rules of "transaction irrevocability'" associated with a clearing or settlement system will determine whether, and to what extent, a bank may be assuming clearing risks to a client.

3.11. Systemic Risk

This risk comes about due to linkages with other FMIs. It is the concern that a problem or default at one FMI can have a "domino" effect on another network resulting in a cascading series of defaults and failures, even across markets, regions or globally.

Similarly, a default at a financial infrastructure network can cause widespread liquidity (or credit) problems for other participants, which could ultimately cripple the market. Systemic risk can also arise if a system has the legal and technical ability to unwind a clearing session or lacks sufficient resources to meet the settlement obligations of the market.

3.12. Country Risk

This risk occurs when action by a government affects the system in a way that is detrimental to the participants, for example, exchange controls, expropriation of assets, financial market instability, lack of central bank support during a crisis, or disruption of services due to war, civil unrest, or terrorism.

Most Significant Risks / Events

The following risk events were cited as presenting the most important or significant risks to members or participants.

- Event risk or crisis caused by the default of a large member or members, including:
  - Risk that the FMI's financial safeguards (funds, collateral) are insufficient to cover the default of a large member or members.
  - Risk that loss sharing structures impose unlimited liability to remaining members.
- Concentration risk as CCP FMIs become larger and more active in a variety of products.
- Adequacy and reliability of risk management framework, including collateral management.
- Weakening of risk management tools and techniques as FMIs become "for profit" and/or public companies.
- Impact of cross border FMI activities where the underlying legal and regulatory regime that would govern the FMI may restrict its operations or may not be clear.
- System settlement failure risk.
- Systemic risks, including sovereign risk.
- Timely compliance with evolving regulations and laws, especially when requiring system and process changes.
- Disruption in case of inadequate disaster recovery plans.
- Operational risk and inability to maintain infrastructures to support increasing volumes and more diversified products and services.
- Risks associated with the margin, capital and loss sharing arrangements in the less viable exchanges or those in more politically sensitive countries.
- Lack of controls in underdeveloped regions/countries and minimal rule of law in some areas.
- Situations where the legal environment does not support the rules and bylaws of an FMI (i.e., netting and collateral enforceability).
- Risk of unilateral changes in the rules by FMIs, without approval or input from members.

4. How Banks are Currently Managing, Measuring and Mitigating Risks

There are two broad approaches to how banks are currently measuring and managing the risk of participation in FMIs. One approach is by a dedicated risk management department or group that has overall responsibility, and the second approach is by a collection of specialists, i.e., credit, legal, compliance, operations, treasury, etc.

Some examples of how and where the risk is being managed organizationally are set out as follows:

- New products committee.
- New business approval committee.
- The business unit level.
- Collection of specialists including operations, financial control, operational risk, market risk, credit risk, it, legal, compliance, treasury and tax.
- Dedicated risk management department, headquarters based.
- Specialists in each country/region. These include credit, legal, compliance, operations and treasury. The approval rests with a corporate committee.
- Two groups, one for payment and custody systems, and one for exchanges/clearinghouses and securities settlement systems.

4.1. Tools and Methods

There are a variety of tools and methods being utilized to assess FMI risk. They include questionnaires, operational flow documents, legal reviews, and risk rating processes. Some specific examples are:

- Questionnaires: fact gathering documents on the FMI that cover matters such as credit structure, operational robustness, management quality, financial strength, risk management and liquidity safeguards.
- Operational flow documents: timelines or flow charts of how a system operates and processes transactions with a focus on key activities, such as transaction entry/capture, movement of collateral or margin, timing of netting, settlement finality, and default procedures.
- Legal reviews: focused on contractual arrangements with the FMI; may include both contractual arrangements and the underlying legal environment (netting, finality, bankruptcy provisions, etc.)
- Risk rating process.
- Technology review.
- Financial analysis of the FMI.
- Credit analysis of financial exposures (guarantee fund deposits, collateral, central counterparty exposures, equity stake, etc.)
- Benchmarking against industry best practices.

- Assessment of internal controls from the perspective of customer credit, funding, legal, and compliance.
- New business related approach and documentation.
- Operational risk assessments (volume capacity, resiliency and contingency): when joining, periodic, material change event or dependent on risk profile.

4.2. Measuring Risk

Most of the banks are measuring or quantifying the potential for loss that arises as a result of being a member or participant in a network. Various types of financial exposures are being quantified and differing methodologies are being utilized. Some specific examples are:

- Loss sharing formulas are reviewed and worst case scenarios are assessed and estimated.
- For high risk FMIs acting as CCPs, current exposure and potential exposure based on open transactions are calculated and reported. For low risk FMIs, only current exposure is calculated and reported.
- Membership related exposures for all businesses sponsoring the FMI are calculated. The types of financial exposures quantified include margin (customer and house), collateral, guarantee fund deposits, pre-funding, loss sharing obligations, pre-settlement exposure (when the FMI is the counterparty) and certain forced credit extensions associated with membership. The methodology is to reflect actual outstandings for all categories except for loss sharing, where participant default scenarios are used to estimate exposures to loss sharing in extreme events.
- Risk mitigation controls are based on close monitoring of net settlement exposure to FMIs taking into consideration a bank's short-term funding position, collateral amount, marketable securities, unused balances of borrowing limits, and other factors.
- Measurement of the potential for loss with respect to margin or capital at risk. Also loss sharing among members and back up credit facilities are considered.

4.3. Documenting Risk

All banks are documenting, in one way or another, the risks associated with FMI participations. Some of the methods being used are:

- An assessment matrix which looks at system risk from the perspective of financial standing, membership standards, risk management, legal and operations.
- Assess controls from the perspective of customer credit controls, funding, legal, compliance, operations and system support, which are then documented.
- Risks are documented in risk summaries that are prepared for each FMI. Depending on the severity of risk issues identified, risk mitigation strategies are documented for future follow up.

4.4. Mitigation of Risk

Banks use a variety of techniques to mitigate FMI risks, including:

- Setting limits for high risk exchanges.
- Negotiating contractual exemptions.
- Moving to less capitalized legal vehicle.
- Joining as limited member or indirectly.
- Limiting activity if practical.
- Conducting business via another FMI if possible.
- Influence the reduction of risk by participation on boards, working groups, industry groups, etc.

5. Recommendations

The management of risks that a financial institution bears as a result of its participation in FMIs is an evolving field. As such, this report should be considered a "living" document. Going forward, it should be expected that this document would be revised to incorporate industry feedback and become richer over time.

Based on the survey information collected and the subsequent Task Force discussions, the Task Force has at this time developed 10 recommendations for sound management practices for banks to consider and apply as appropriate within their institution. The recommendations are:

1. A bank should have documented risk practices and policies for addressing its memberships and transactions with FMIs identifying responsibilities for assessing, approving, reporting and managing the risks.

2. A bank should conduct the appropriate level of due diligence in analyzing and approving the risks of being a member of or transacting with a FMI.

3. A bank should have a clear understanding and reporting of any membership-related credit risks and exposures to a FMI. This includes loss sharing financial obligations to cover the default of another member and direct credit risks to a FMI that serves as a central counterparty to trades/transactions.

4. A bank should have a clear understanding of any material operational risks it takes as a member or counterparty of a FMI. A bank should consider the need to perform periodic assessments (on-site or via inquiry) of a FMI's operations where the bank conducts significant activity.

5. A bank should have a clear understanding of any material legal risks it assumes as a member of a FMI. An analysis should be conducted when a bank first joins a FMI that identifies and assesses any undue contractual liability, the lack of legal support for key activities of the FMI (e.g., finality, netting, collateral rights), and any important/undue compliance requirements.

6. A bank should have practices and policies in place to ensure that its understanding of any of its material risks to a FMI are current. This includes monitoring and assessing material developments at a FMI and/or performing periodic risk assessments.

7. A bank should require appropriate level management review of participation in select FMIs that present material adverse risks, such as exposure to open-ended liability.

8. A bank should establish a framework for mitigating risks to FMIs as appropriate. This includes, but is not limited to negotiating contractual provisions, using a small capitalized subsidiary as the member to limit liability, setting transaction/trading limits, accessing the FMI indirectly via a correspondent, or via active governance by serving on boards, industry groups, committees, etc.

9. A bank should ensure that its own continuity of business planning takes into account operations failures at major FMIs.

10. A bank should consider whether having a centralized risk management approach to FMI risk -- where a small risk management staff specializes in bank-wide FMI risk analysis and performs portfolio level monitoring and reporting -- is a more effective and efficient way to manage the ongoing risks with FMIs than through a decentralized approach.

Following from the recommendations, the Task Force created a table (see Appendix 3) that sets out the risk types (outlined in section 3) that would be addressed by each recommendation, and further suggests tools and methods that may be used to assess/cover the risks specific to each recommendation.

Appendix 1: FMI Risk Task Force

Members of the Task Force

Task Force Leader	Mr. Gregory E. Fell, Citigroup
Bank of America	Mr. Michael Dasher Mr. Peter Hohenstein Mr. Umesh Gupta
Bank of New York	Mr. Mark Rogers
Bank of Tokyo-Mitsubishi UFJ	Mr. Thomas Amato Mr. Carl Campbell
Federal Reserve Bank of New York	Mr. Lawrence Radecki
JPMorgan Chase	Mr. Joe Corbo Mr. Ricardo Chiavenato Mr. Liam Fagan
UBS	Mr. David Keenan Ms. Rebecca Sangha
Wachovia	Ms. Yoko Horio
Wells Fargo	Ms. Linda Leo

Appendix 2: FMI Risk Survey Questionnaire

Financial Market Infrastructure Risk

Survey Questionnaire

The scope of this Survey is to cover all of your institution’s direct participations with Financial Market Infrastructures (FMIs). In completing this survey, you should consider all of the following relationships:

- Trading memberships at securities exchanges (e.g., London Stock Exchange, Tokyo Stock Exchange, Swiss Exchange) and derivatives exchanges (e.g., Eurex, CME)
- Clearing memberships at securities clearinghouses (e.g., NSCC, Japan Securities Clearing Corporation)
- Clearing memberships at derivatives clearinghouses (e.g., LCH.Clearnet, CME Clearing House, Hong Kong Securities Clearing Corporation)
- Memberships at securities depositories and settlement systems (e.g., DTC, CREST)
- Direct participations in payment systems such as large-value funds transfer systems (e.g., CHIPS, Euro1)

FMIs used to mainly support consumer banking activities (e.g., credit card systems, ATM networks etc) are outside the scope of this Survey.

Summary Statement

1. Please provide some general information about the scope of your institution's’ involvement with FMIs. Please give some information across the different types of FMIs and in the different regions in the world (Asia, North America, Latin America, Europe, etc.)

   An example may be:

   “Our institution trades directly on various securities exchanges in North America and Europe, but not in LATAM, CEEMEA or Asia. Our firm only self-clears securities in Europe (and therefore has no direct memberships in securities clearinghouses outside of Europe). Our institution is only a direct participant of securities depositories in Europe. Outside of Europe we rely on custodians. Our institution does not trade derivatives directly at any exchange; we use the trading services of other firms. Our firm is a direct member of payments systems in all parts of the world except LATAM.”

I. Regulatory and Policy Requirements

1. Are there local laws, regulations, or supervisory requirements (in your home jurisdiction) that require your institution to assess/manage risks and exposures to FMIs defined as exchanges, clearinghouses, payment systems, and settlement networks? If yes, please list and briefly describe the relevant laws or regulations.
2. Does your bank have any written policies or procedures to govern participations and/or memberships at FMIs? If yes, what is the scope of such policies and describe them briefly.
3. Is the overall governance approach of your institution to FMIs and FMI risk centralized or de-centralized?

II. Assessment of Financial Market Infrastructure Risks

1. Is there a dedicated risk management department or group that is responsible for identifying, assessing and approving the risks of membership/participation at FMIs? Or, are the risks assessed/approved by a collection of specialists, i.e., credit, legal, compliance, operations, treasury, etc.?
2. What risks (e.g., credit, legal, operational, compliance, liquidity) are assessed whenever a business joins a new FMI?
3. What general procedures or processes are followed when a business decides to join a new FMI? Who within the organization is responsible for approving new memberships? Do both Business Management and Risk Management have to approve new memberships?
4. What type of tools or methods, if any, are utilized in your institution to assess FMI risk, i.e., questionnaires, operational flow documents, legal reviews, risk rating processes, etc.?
5. If a legal analysis is done on an FMI, what does it cover? Does it simply cover contractual obligations/liabilities and compliance matters? Or does it also assess the strength of the underlying legal regime supporting key features of the infrastructure such as netting, finality and collateral rights?
6. Does your institution perform an operational assessment (on-site or other) of FMIs when you become a member? Once you are a member, are operational assessments performed on a periodic basis, and if so, how frequently?
7. Is there formal (standard) documentation of the risks associated with memberships at FMIs? If so, what is its scope?
8. Once a business joins an FMI, are periodic risk assessments conducted? If so how frequently and by whom?

III. Measurement of Financial Market Infrastructure Risks

1. Does your institution ascribe any risk ratings to FMIs that seeks to provide some relative measure of the likelihood for loss as a member?
2. Does your institution assign credit ratings for FMIs?
3. As part of your bank's risk assessment/management process, is there a measurement or quantification of the potential for loss that arises as a result of being a member or participant of a network? If yes, what types of financial exposures are quantified in your institution? What methodology is used?
4. As a member of an FMI, an institution may be called on to cover losses stemming from another member's default. Such losses may be in the form of the loss of a guarantee fund deposit made by your bank or from a general call on members to cover losses. How does your organization view such exposures? Are they considered credit exposures? Are such exposures quantified?
5. For exchange-traded derivatives, and for an increasing number of stock exchange trades, trading is anonymous and a clearinghouse is the central counterparty (CCP) (principal) to trades. Does your institution establish credit lines vis-à-vis these clearinghouses to cover this counterparty risk?
6. Are FMIs "credit-managed" to cover any membership related credit exposures such as cash margin deposits, guarantee fund deposits, loss-sharing exposures, pre-settlement exposures to CCPs?

IV. Management and Mitigation of Financial Market Infrastructure Risks

1. Some memberships at FMIs impose unlimited (open-ended) liability to its member firms? Are such risks (or other significant risks) reported to Senior Management or the Board of Directors for review or approval?

2. Are there processes in place at your institution to monitor the on-going risks and exposures to FMIs?
3. Does your institution report FMI risks and/or exposures to senior management and/or record them for financial reporting purposes?
4. Does your bank take steps to manage and mitigate or reduce the risks associated with being a member or participant of an FMI? If so, how?
5. Is economic capital allocated against any of these risks?
6. Is your bank active on boards, industry groups, committees, etc. as part of the management and mitigation of network risks once identified?
7. Does your bank maintain continuity of business plans that adequately address an external network's operational failures, and are related operational losses reported internally?
8. Is your bank involved in governance initiatives, working to achieve enhancements in the design and/or operation of a network in order to mitigate risk exposures over time?
9. What does your institution see as the most significant risks to memberships in FMIs?

Appendix 3: FMI Risk Recommendations Grid

Following from the recommendations of the Task Force, this table sets out the risk types (outlined in section 3) that would be addressed by each recommendation, and further suggests tools and methods that may be used to assess/cover the risks specific to each recommendation.

Recommendation	Risks Addressed	Tools and Methods
1. A bank should have documented risk practices and policies for addressing its memberships and transactions with FMIs identifying responsibilities for assessing, approving, reporting and managing the risk.	All (Credit/Membership, Legal, Market, Operational/Technology/ Security, Compliance/Regulatory, Liquidity, Clearing Bank/Settlement Bank, Reputation/Franchise, Financial, Customer Credit, Systemic, and Country)	Policies to govern how FMI risk would be managed within the bank, including roles and responsibilities.
2. A bank should conduct the appropriate level of due diligence in analyzing and approving the risks of being a member of or transacting with a FMI.	All	A due diligence process and procedures to analyze and approve new FMI memberships. Tools utilized can be a questionnaire, operational flow documents, legal review, risk rating, technology review, financial analysis of FMI, credit analysis of exposures, benchmarking, internal control assessment, operational risk assessment, etc.
3. A bank should have a clear understanding and reporting of any membership-related credit risks and exposures to a FMI. This includes loss sharing financial obligations to cover the default of another member and direct credit risks to a FMI that serves as a central counterparty to trades/transactions.	Credit, Market, Clearing Bank/ Settlement Bank, Financial, and Customer Credit	Questionnaire, operational flow documents, legal review, and risk rating.
4. A bank should have a clear understanding of any material operational risks it takes as a member or counterparty of a FMI. A bank should consider the need to perform periodic assessments (on-site or via inquiry) of a FMI's operations where the bank conducts significant activity.	Operational/Technology/Security, Compliance/Regulatory, Liquidity, Clearing Bank/Settlement Bank, Systemic, and Country	Operational flow documents, operational risk assessment, technology review, internal control assessment, and benchmarking.

Recommendation	Risks Addressed	Tools and Methods
5. A bank should have a clear understanding of any material legal risks it assumes as a member of a FMI. An analysis should be conducted when a bank first joins a FMI that identifies and assesses any undue contractual liability, the lack of legal support for key activities of the FMI (e.g., finality, netting, collateral rights), and any important/undue compliance requirements.	Legal, Compliance/Regulatory, and Systemic	Legal review.
6. A bank should have practices and policies in place to ensure that its understanding of any of its material risks to a FMI are current. This includes monitoring and assessing material developments at a FMI and/or performing periodic risk assessments.	All	All (abbreviated process) for the purpose of periodic reviews to determine if material changes have taken place in the FMI.
7. A bank should require appropriate level management review of participation in select FMIs that present material adverse risks, such as exposure to open-ended liability.	All	Senior management review/ escalation.
8. A bank should establish a framework for mitigating risks to FMIs as appropriate. This includes, but is not limited to negotiating contractual provisions, using a small capitalized subsidiary as the member to limit liability, setting transaction/trading limits, accessing the FMI indirectly via a correspondent, or via active governance by serving on boards, industry groups, committees, etc.	All	Develop mitigation of risk options/strategies for each material risk identified.
9. A bank should ensure that its own continuity of business planning takes into account operations failures at major FMIs.	Market, Operational/Technology/ Security, Liquidity, Clearing Bank/Settlement Bank, Reputation/Franchise, Financial, Customer Credit, and Systemic	Incorporate in continuity of business planning process.