



# Managing liquidity risk in a changed and global world

**White paper**

**March 2010**

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## Executive Summary

**This white paper seeks to engage you - bank treasury and payments transaction business managers - on the topic of liquidity risk, and how you can help avoid severe implications when lacking control over it.**

Many books and papers have been and will be written about the liquidity crisis that started mid 2007, the collapse of Lehman Brothers in September 2008, and its effect on the “real” economy. During the crisis, liquidity in the international transaction system evaporated as a consequence of the complexity of interconnected systems, the difficulty in alignments of operational practices, and trust issues between banks.

Equally, much has been written about the efforts by politicians, central banks and regulators to restore liquidity in the financial system and take measures to avoid such a crisis from happening again.<sup>1</sup>

This paper does not attempt to rewrite that commentary. Instead, we use the financial crisis as a backdrop to the tsunami of regulation that is coming your way, and as motivation to look ahead.

This is a call for action. The banking landscape has changed. The list of banks that failed, were forced into mergers or rescued is long. Equally, many other banks were well prepared and are now ready to capitalize on new opportunities. The question is: where is your bank at, will it survive the next crisis, and what can you do about it?

There are many facets to liquidity risk management.

Managing liquidity risk requires decisions at multiple levels of aggregation (transaction, product, business line, and bank-wide). Funding must be there for all transactions, current and future. Failure to do so could ripple through the entire bank and banking system.

So where to start? Whilst liquidity risk must be tackled top down and calculated bottom-up, we believe there are two dimensions that underpin everything else and that you can address now -

**improve your intra-day liquidity visibility, and improve your liquidity forecasting capability:**

### 1. **Improve intra-day liquidity visibility, through better communication flows**

To obtain and maintain a full, intra-day visibility on your liquidity risk position requires connecting up and gathering position and liquidity information from various internal systems, business lines and divisions within your bank. But you need to go beyond that. As the origins and consequences of the liquidity crisis were global, the actions you need to take, have to reach beyond your bank. To get a true view on exposure, you need to link up branches and subsidiaries, as well as ensuring better communication flows with the ‘external world’ of account holding institutions and agents, systems and market infrastructures.

### 2. **Improve liquidity forecasting capability, by building a transaction data warehouse**

The timing of liquidity has increased in importance. Whereas positions were previously considered end-of-day, liquidity risk now needs to be managed intra-day, short term one week out, as well as determining longer term funding requirements, running liquidity stress tests and calculating forward exposure... simultaneously. Reports to management, board, and supervisor include data ranging from intra-day to a three-month perspective. To achieve this, you first need to build a data warehouse of detailed and timed transactions, events and positions across your bank. This data can then feed a calculation engine, be used to generate scenarios and produce reports for decision making.

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<sup>1</sup> A selection of key documents is provided in annex 1.

In this paper, we offer a deeper reflection on liquidity risk management at banks and on these two dimensions in particular. Whilst we do not claim to have 'all the answers to all questions', we will suggest possible avenues and actions for improvement.

Our thinking is developed in five thematic steps:

- 1. The specific nature of liquidity risk** has driven the banking community to
- 2. More regulation and best practice**, and this
- 3. Changed reality is pointing to gaps in current practice**, into which
- 4. Banks need to invest now**, whilst at the same time
- 5. Working together, for the benefit of each.**

Indeed, in addition to making improvements at your own organisation, there should be more industry dialogue with a view to developing collaborative solutions.

We hope to stimulate your thinking, gather feedback, engage in dialogue, and evolve this white paper over time to reflect our enhanced collective understanding.

We look forward to your thoughts and opinions.

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## 1 The specific nature of liquidity risk

Risk management is inherent to the business of a bank - acting as an intermediary between depositors and borrowers, providing liquidity, and operating systems to handle banking transactions.

Risk can come from multiple sides, be it credit/counterparty, settlement, market, operational or event/environment driven. A sixth type, with a causal link to the other, is liquidity risk <sup>2</sup>.

### 1.1 Liquidity risk as element of banking risk

Liquidity risk is the loss a bank incurs because it does not have sufficient liquid funds to enable it to meet its obligations as they fall due.

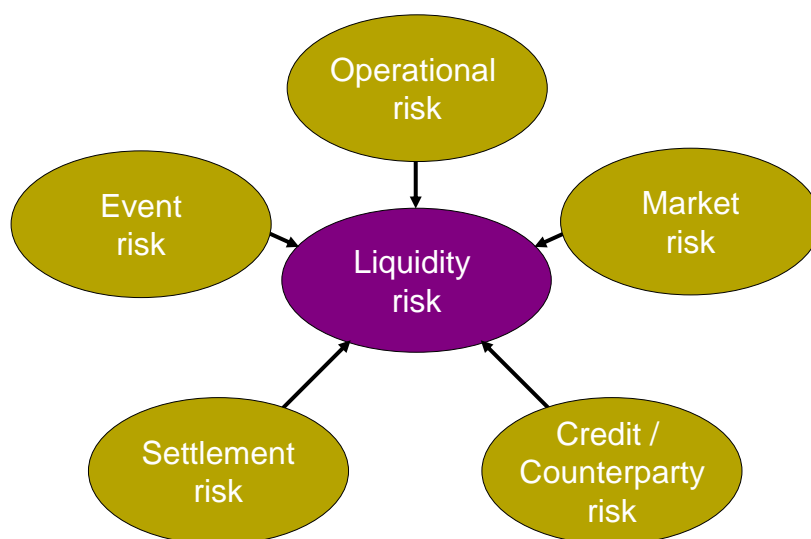
Such a risk applies to all financial transactions and all underlying liquid assets, be it securities, derivatives, cash or custody.

Banking activities create liquidity risk, intimately linked with the other types of risk directly or indirectly influencing the liquidity position of a bank. For example, unplanned downtime of a payments system may mean the cut-off time to a clearing system is missed, creating an exposure. A drop in the market price of stock options will decrease their asset value and a sale can therefore not free up the amount initially expected and needed for funding. A default by a major counterparty may in turn impact your bank's capability to fulfil its own obligations to pay on time.

Exhibit 1

### Liquidity risk as element of banking risk

Source: SWIFT



While the other types of risk are well documented, with best practice and systems in place, liquidity risk has been considered less. Indeed, as interbank liquidity was readily available on the global market, the liquidity risk discussion was often reduced to a price issue.

However, as the recent global financial crisis demonstrated all too well, risk management practices did not establish a comprehensive understanding of all risks associated to liquidity. Many banks had not implemented precise tracking mechanisms. Regulators did not have a coherent, global framework for supervision and risk mitigation.

And the implications when lacking control over a liquidity position can be severe. A serious liquidity incident can lead to bankruptcy. Missing a big transaction will impact interbank trust and future ability of an institution to lend and hence to fulfil overall counterparty obligations. Liquidity events can impact the broader market as a perceived illiquidity will have a strong effect on prices and values of related assets.

<sup>2</sup> For a more comprehensive description of risk categories, see annex 2

Even if the impact of a liquidity incident does not always drive to failure, individual banks can still incur major losses from inadequate liquidity risk management. These losses can be financial, as emergency funding is not only expensive and can draw away funds needed for other activities of the bank, but also operational, as system disruptions are only fixed at a high cost. These events can prove fatal to a financial institution, as proven in the case of Lehman Brothers (and probably other banks had there not been major government intervention).

## 1.2 Drilling down liquidity risk

Looking more closely at liquidity risk, four types can be identified:

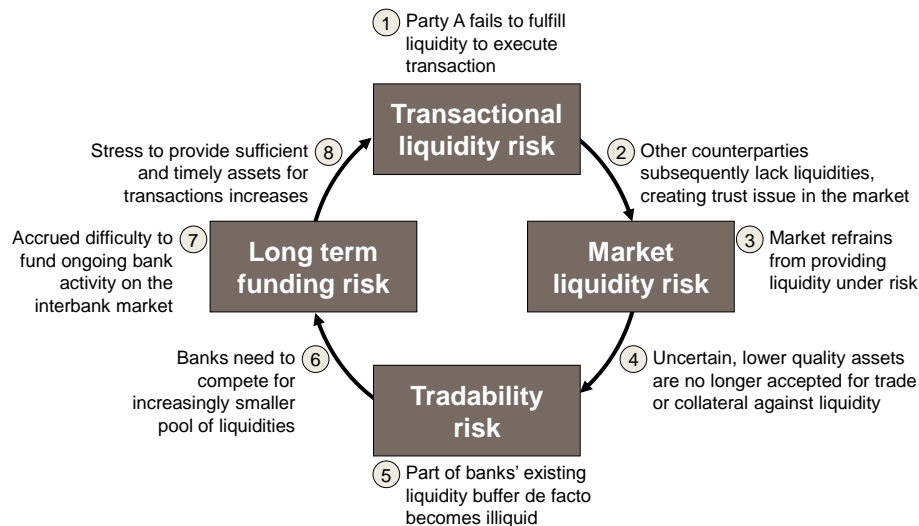
- **Transactional or short-term liquidity risk:** a bank cannot fulfil payment obligations as and when they occur (securing payments), focus is on intra-day and 2-3 days out;
- **Market liquidity risk:** the market on which liquid assets need to be exchanged is no longer working sufficiently, making execution of borrowing or trade impossible. Market liquidity risk can arise from an event (e.g. 9/11), or a lack of available buyers/sellers to maintain a liquid market (e.g. CDO market in the 2008 crisis);
- **Tradability risk:** specific assets are no longer accepted for trading at normal conditions, making the liquidation of existing stock impossible (liquidability of assets). Tradability risk can be seen as the ‘institution’ side of the market risk;
- **Longer term funding risk:** bank loses capacity to ensure funds to support current operations and structural growth at reasonable cost. Funding risk can result from wholesale or interbank funding risk, retail funding risk or balance sheet mismatch.

These types of liquidity risk can impact each other in a vicious circle.

Exhibit 2

## Liquidity risks could create a vicious circle

Source: McKinsey & Company



## 1.3 The onward spread of risk into multiple systems

Incidents can also spread across an entire market and into multiple clearing systems: one financial transaction can trigger other transactions in multiple clearing systems. One incident can draw funds away from other systems and players, making previously liquid asset suddenly untradeable, and destroying a bank's long term funding strategy. Such a chain of events could create a systemic incident. The systemic value at risk becomes even bigger as clearing systems connect the broader economy (payments for trade and consumption) to the more volatile world of securities and exchanges, making a direct impact on the “real” economy possible.

## 2 More regulation and best practice

Banks have stepped up their liquidity risk mitigation, building on mechanisms already in place: heightened monitoring of (settlement) limits, maximizing delivery versus payments (i.e. not paying in case of doubt), closer follow up of counterparty risk (e.g. daily watchlist committees), increased collateralisation (making sure all transactions occur in a collateralised systems) and system duplication to manage operational risks.

However, with such severe consequences of liquidity risk on banks, the economy, and wider society, it should not be a surprise that even more regulation and best practice is coming.

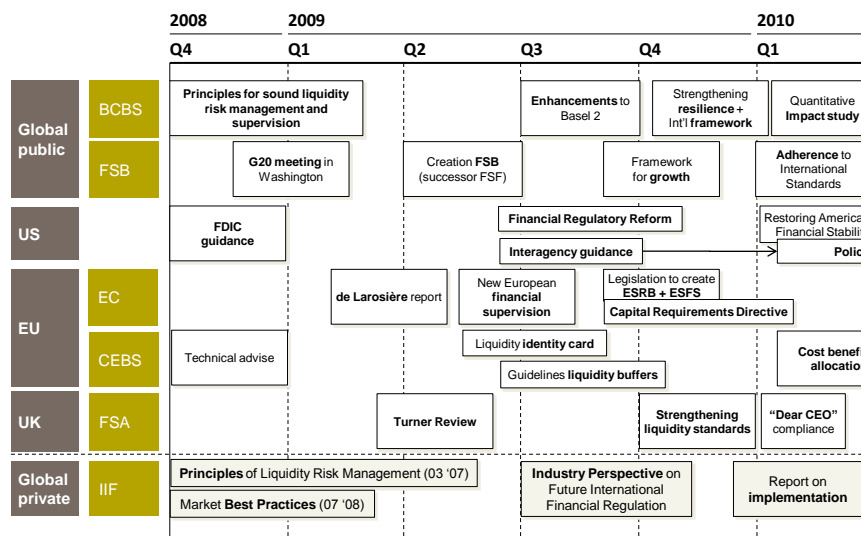
There are multiple initiatives at global, regional and domestic level by the public and private sector. Whilst some started back in 2000, they have multiplied since September 2008, and are or will be in effect by 2012.

Here is a selection of key events, frameworks and legislation regarding liquidity risk.<sup>3</sup>

Exhibit 3

### More liquidity risk (self) regulation

Source: SWIFT



The question now is to what extent these can converge and establish common practice around the globe, given that many banks are indeed global organizations.

<sup>3</sup> A more detailed overview, as well as websites with further resources are provided in annex 3.

### 3 The changed reality is pointing to gaps in current practice

Regulation and best practice needs to address the shortcomings of current liquidity risk management and systems, painfully highlighted in the financial crisis.

In a market riddled by lack of trust, the amount of liquidity available throughout the global system turned out to be much smaller than anticipated. In addition, assets believed to be liquid turned out not to be. Collateral, that could have helped to restore trust, lost value and no longer covered the volume of exchange needed.

As a result, liquidity became more expensive and more difficult to obtain for most banks, while more was needed. For some banks, short term funding dried up completely, sending them scrambling for government help.

#### 3.1 Some problems identified

Some of the problems that led to this result, in particular related to transactional liquidity risk, are:

##### 1. Insufficient awareness of chain of events

- Risk management solutions that minimize counterparty risk by not executing deals until the last minute (such as avoidance or watch lists) reduce risk for one player but increase liquidity risk to the system and the other players who expect the money;
- Liquidity movements created intra-day open positions, while market shortage did not allow to close all of these end-of-day;
- Careful timing of payments across systems and departments is crucial as well as understanding the consequences of non-execution e.g. payroll payments sometimes have to be entered into clearing systems a few days in advance;
- Trading and credit risks can collide with reputation and legal risk when doubtful transactions come up for execution. E.g. not executing payroll payment for troubled companies, where funding is not 100% confirmed, can trigger a default and send the entire company into bankruptcy.

##### 2. Siloed approach

- In larger banks, stopping outgoing payments to one particular counterparty requires co-ordination across several units and geographies - a manual process in most institutions;
- Very few banks actually run their payment and securities treasury under common supervision, leading to a fragmented and poorly coordinated approach where, for example, the trading room looks at counterparty and position risks, payment back-offices at operational risks, and treasury at liquidity risk;
- Lack of co-ordination between trading, asset liability management (ALM) and back-office made it difficult to stabilize positions: some traders kept on doing business and back-offices kept executing them, whilst ALM departments had trouble finding funding. With little communication and few reports between these entities, decisions to pace outgoing payments had to go via the top of the organization;
- Most liquidity risk management systems track transaction risk within one given clearing system, with little attention to cross-system risks.

### 3. Insufficient information

- In many cases only 60-70% of available funds are visible at any time to international bank treasurers, due to lack of appropriate organization, reporting systems, but also insufficient or (too) infrequent information or reporting;
- Incidents in trading systems made banks aware of secondary risks of trading partners or from sponsoring secondary participants indirectly to local clearing systems;
- Liquidity management systems have been developed around the way operations should be conducted, but do not factor in that people on the shop floor deviated from 'the book'. Not acknowledging such deviating business practices increases the likelihood of incidents, and prevents the impact of risk measures taken.

### 4. Insufficient transparency on detailed liquidity positions

- Having a perspective on overall liquidity exposure is not enough; it needs to be detailed per transaction system, counterparty legal entity, and include timing of execution;
- Counterparty legal entities and their location do matter. Accessing liquidity depends on the legal entity carrying the exposure (as opposed to group limits). The legislation of the geography this entity is incorporated in determines the terms and conditions of failure, and the claiming of assets.

## 3.2 Requirements identified, challenges abound

With these problems understood in hindsight, it becomes clearer what needs to be done – and whilst new requirements emerge, the challenge is to find solutions.

Exhibit 4

## Emerging gaps in a changed reality

Source: SWIFT

Activity	Requirement	Challenge
Short term liquidity and collateral management	<ul style="list-style-type: none"> <li>• Manage Intra-day liquidity positions</li> <li>• Predictive cash forecasting</li> <li>• Payment flow control</li> <li>• Collateral management, incl. haircuts, ...</li> </ul>	<ul style="list-style-type: none"> <li>• Current visibility only 60-70%</li> <li>• Reduce liquidity buffer</li> <li>• Adequate liquidity management system</li> <li>• Receive granular intra-day cash reports</li> <li>• Central view across the bank</li> </ul>
Funding operations	<ul style="list-style-type: none"> <li>• Define funding strategy, contingency plan</li> <li>• Support operations and structural growth</li> </ul>	<ul style="list-style-type: none"> <li>• No exact view on intra-day requirements</li> <li>• Flight to quality</li> </ul>
Longer term risk assessment	<ul style="list-style-type: none"> <li>• Calculate forward risk exposure</li> <li>• Define counter balancing capacity</li> <li>• Run stress tests, identify periods at risk</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate liquidity risk system</li> <li>• Lack of granular, timed, transaction data</li> <li>• Does analysis result in action?</li> </ul>
Reporting	<ul style="list-style-type: none"> <li>• Report to management, board, supervisor</li> </ul>	<ul style="list-style-type: none"> <li>• Evolving requirements</li> <li>• Local vs. global</li> <li>• Bank activities in multiple jurisdictions</li> </ul>

Within the liquidity risk area, we can distinguish four different activities, each with its own set of challenges:

- **Short term liquidity and collateral risk management**  
Banks need to collect information on their cash positions and determine associated needs and risks on an intra-day basis. But they also forecast cash requirements, and control the flow and timing of payments. In addition to managing 'the cash', a bank needs to manage its collateral and

calculate the value of underlying assets with the market value reduced by a certain percentage (haircut).

The challenge for banks is to increase the visibility on funds available, and make these funds more readily reachable, so reducing the current oversized liquidity buffer. For that, banks need an adequate liquidity management system that is able to control the payment flow and prioritize (e.g. a stop/go button), receive more frequent and granular intra-day cash reports<sup>4</sup>, and be able to build a central view of cash across the bank.

- **Funding operations**

Once funding strategies have been defined, contingency plans put in place and liquidity buffer requirements determined, the front office needs to obtain the necessary funding from the market.

The challenge for banks is to obtain enough resources at intra-day level, while building contingency for the increased difficulty to access funds in a less liquid market. Hence, bank treasurers need to maintain a permanent view of intra-day requirements, while at the same time ensuring enough quality of assets in the liquidity buffer, as well as strengthening some privileged funding relations with other parties, in order to avoid major liquidity availability issues.

- **Longer term risk assessment**

As part of the new market requirements, banks need to calculate forward risk exposure, define counter balancing capacity, and run stress tests to identify periods of risk and maximum funding needs.

The challenge for banks will be to deploy an adequate liquidity risk application in order to have the underlying data available, and build up a solid interpretation approach so that they can actually do something with the resulting knowledge. Banks therefore need to build their risk assessment and forecasting tools, beyond the mere Excel spreadsheet, into a solid and tested toolkit. They must also build a link back from the test results to the operational management of liquidity risk. Banks will also need to build a holistic perspective of their risk across all types of events, be it counterparty, operational or liquidity, in such a way that solutions are optimal for the comprehensive bank position.

- **Reporting**

The requirement on reporting key liquidity risk indicators and exposure has increased dramatically. This information, at various levels of detail and aggregation, is asked for by management, boards, and supervisors.

The challenge for banks is that, in particular on the regulatory level, these requirements are evolving, and there is 'competition' between local and global initiatives and best practice. In addition, a bank with operations in multiple countries will be faced with 'home' and multiple 'host' requirements. A possible solution is a set of templates and reporting modules that can be made available as needed. Rather than building individual sets per bank, an agreement between major players would make such reporting a better base for future risk management, and more defensible towards regulators.

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<sup>4</sup> An analysis in the 1<sup>st</sup> half of 2009 of intra-day debit and credit confirmations ((MT900 and MT910) received by banks on SWIFT revealed a gap of 27% versus what should have been received in relation to the number of payments they sent.

## 4 Banks need to invest now

Whilst addressing new requirements on liquidity risk, banks cannot afford to wait until “it is all figured out”.

Before and during the crisis, many banks did have their liquidity management under control, but obviously many others did not.

The questions for you are: how well does your bank manage its liquidity risk, what steps has it taken so far, what remains to be done, and what role can you play in this?

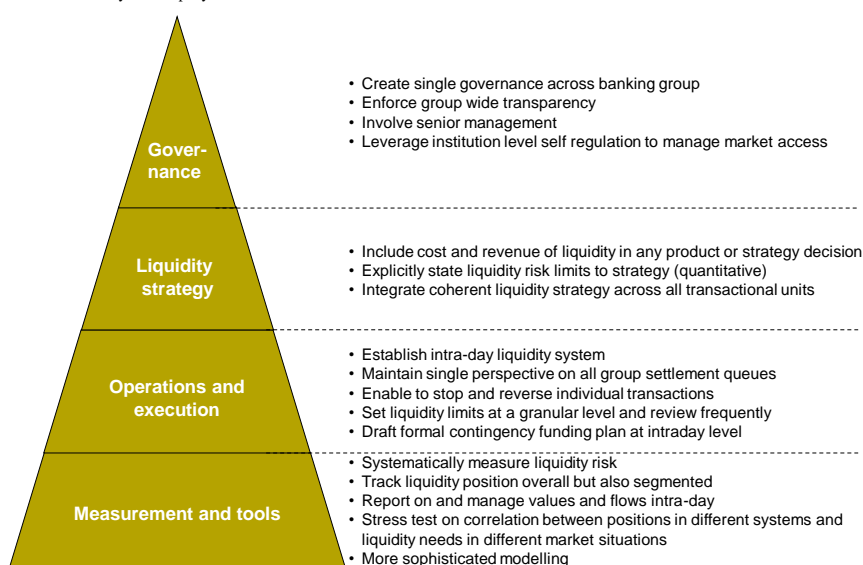
### 4.1 A top-down approach

Liquidity risk must be addressed top-down, starting with governance, then defining the overall risk appetite of the bank, and then implementing across the board.

Exhibit 5

### Addressing liquidity risk top-down

Source: McKinsey & Company



We see actions required on four levels:

#### 1. Governance

Current management structures are often ill equipped to deal with the new reality of cross-border and cross-unit liquidity.

Banks should create a liquidity risk management unit across group entities; set up an internal control system spanning the entire transaction business of the group; and enforce transparency; and involve senior management in the entire liquidity risk set-up.

#### 2. Liquidity strategy

Whereas solvency is factored in when drafting group-wide strategies, liquidity often is not. Banks should define their risk appetite and explicitly state liquidity risk limits to strategy; price internally and externally for liquidity risk i.e. include cost and revenue of liquidity in any product or strategy decision - if real funds transfer pricing was calculated, certain business lines may actually not be (as) profitable; integrate coherent liquidity strategy across all transactional units; build an active approach to manage and segment collateral for transaction systems; and diversify sources of funding and channels for market access and build contingency funding plans.

#### 3. Operations and execution

Transaction systems and operations have to be adapted to allow granular management of liquidities and direct centralized interventions if needed.

Banks should establish an organization-wide intra-day liquidity management system, real-/near-time monitoring of liquidity exposures, allowing the scheduling and prioritization of individual payments; maintain a single perspective on all group settlement queues in parallel, and optimize

the number of interconnections: e.g. limit to a minimum the different interfaces with the same counterparty; set up automated emergency action workflows, enable emergency systems to be able to stop and reverse individual transactions in queues across all connected systems, and draw guidelines on how and where to stop processing transactions; enforce compliance to use a formal settlement policy: e.g. manage 'trust based' execution of correspondent services, set liquidity limits at a granular level and review frequently; and a draft formal contingency funding plan at intra-day level and outline an incident communication plan, across all relevant markets.

#### 4. Measurement and tools

Unlike some other types of risk, there is no single metric to measure liquidity risk.

Banks should take actions including: systematically measure liquidity risk across all silos of the banking group and the connected markets to track all incoming and outgoing flows together with value evolutions of liquid assets; track liquidity positions segmented per settlement system, ensure increased data consistency, counterparty legal entity, geography and bank activity type; report on and manage values and flows intra-day, both at consolidated and granular level, and adjust limits accordingly; run stress test on the correlation between liquidity positions of multiple counterparties, vehicles and settlement systems as well as possible impact to collateral values and liquidity needs in different market situations; and have more sophisticated modeling to forecast liquidity needed on different time horizons (daily, weekly, monthly).

Taking actions on all four levels is a tall order.

A number of projects are needed, and while some can run in parallel, it will take considerable time to accomplish all.

#### 4.2 Immediate focus on foundational dimensions

As a first step, you can look first to improving the short-term, operational liquidity risk management (in any case, in a crisis, you would probably have about 5 days in order to survive).

There are two dimensions that are foundational and underpin everything else: improving both your bank's intra-day liquidity visibility and its liquidity forecasting capability.

##### 1. Improving intra-day liquidity visibility, through better communication flows

Connecting up and gathering position and liquidity information from various internal systems, business lines and divisions inside your bank is a must.

However, the actions you have to take will reach beyond the confines of your bank:

- Branches and subsidiaries – gathering internal liquidity positions via spreadsheets and consolidating on a weekly basis is simply not sufficient anymore;
- Customers and counterparties – efficient communications is vital and even a possible source of new value. Providing a central view of their liquidity at your bank provides corporate customers an enhanced service;
- Account holding institutions and agents – end of day statements give you a start, but receiving more granular statements on an intra-day basis from account holding institutions on key currency accounts has become critical;
- Systems and market infrastructures – once you have figured out all the systems your bank is connected to and what your total exposure is – including that of participants you sponsor with indirect access – communication to and receiving reports from these systems is vital. They are often real-time and involve large values.

To address these issues, you need to invest in establishing better communication flows with the 'external world', and make sure you capture the information that is crucial to building a central, bank-wide intra-day view on liquidity.

## 2. Improving liquidity forecasting capability, by building a transaction data warehouse

A clear, granular and timed management of the underlying transaction is key:

- For short term, intra-day liquidity risk management. It all starts by building a central view of transactions, creating flows of money in and out, understanding how much cash you have available, predicting what your liquidity requirement is intra-day, day+1, day+2, and making sure payment obligations can be fulfilled;
- For funding risk management. It is only once you know to what degree you are 'well' or 'sick' that you know how much funding you need and can go to the market;
- For longer term liquidity risk management. Once you have that very detailed, timed set of transactions and events, you can do analytics, run stress tests, calculate your forward exposure, per product, business line, or counterparty;
- For liquidity risk reporting. Reports to management, board, and other supervisory organizations, must include daily flows out to three months to analyse survival periods and spot potential liquidity squeezes early on.

To address these issues, a high level view on liquidity is not good enough. You need to invest in building a data warehouse of detailed and timed transactions and positions. This reinforces the need to improve communications, connecting up and collecting information and transactions from various internal systems as well from branches.

## 5 Working together, for the benefit of each

Improving liquidity risk management at your bank is a must. In addition, investment in additional collaborative frameworks and industry solutions may be required.

Several efforts are underway to improve (self) regulation and supervision, establish financial stability boards, put in place systemic risk as well as micro-prudential oversight.

In a global market such as banking, a strong international agreement and co-operation will be needed to avoid regulatory arbitrage between multiple countries and jurisdictions, but also to maintain the group-wide overview per bank from the supervisory side. To find the appropriate balance between loose self-regulation and limiting imposed measures, more dialogue between the supervisory and political bodies and the banking sector is required.

On the network, systems and market infrastructures front, it turned out that the current payment and securities information transfer and clearing systems held up correctly during the crisis. It is widely recognized that systems such as CLS or central counterparties (CCPs) for securities, contributed positively to controlling liquidity risk - and need to be leveraged more.

In addition, some collaborative investments to develop or further enhance common solutions could be considered:

- Improve infrastructure:
  - Increase efficiency of existing settlement systems, in terms of reach and speed of execution;
  - Develop a common regulatory framework for clearing infrastructures;
  - Leverage CCPs to create more clarity and structure in reporting, while extending CCP solutions for other transactional instruments;
  - Decide on an optimal number of CCPs across instruments and assess impact on margins;
  - Pool damage control investments: banks are today investing important amounts to filter and screen transactions and better manage risk. Some additional co-operation would be beneficial to reduce overall expenditure.
- Improve products:
  - Define a common rulebook around the provision of intra-day liquidity reports;
  - Establish new forms of payment instruments like e.g. guaranteed payments, to give extra speed to interbank liquidity;
  - Reduce the demand for liquidity, by aligning market practice;
  - Create new intra-day credit instruments.
- Improve crisis co-ordination:
  - Create communication systems and frameworks between institutions to co-ordinate in crisis situations;
  - Develop redress situations and procedures in case of non-compliance in the market.

Improving or setting up new collaborative infrastructures is complex and takes time (building CLS took over 15 years); that should compel us to start the discussion now.

## Conclusion

Throughout the recent financial crisis, we all witnessed the specific and wicked nature of liquidity risk and its severe effect on banks, the global financial system, and the “real” economy.

In this paper, we focus on the new requirements to properly manage liquidity and suggest actions you can take to better manage the associated risk.

Very pragmatically, there are **two foundational dimensions you can address now**:

1. Improve intra-day liquidity visibility, through better communication flows;
2. Improve liquidity forecasting capability, by building a transaction data warehouse.

There is also a positive message of **competitive opportunity**. Banks that manage their liquidity well are thriving. A well executed and fine-tuned liquidity strategy frees up precious capital that can be used to fund growth and new opportunities.

In addition to putting ‘your own house in order’, further **industry collaboration** is required – to evolve regulatory frameworks with legislators and to improve and set up new infrastructure, products and crisis management in the banking industry.

We stand ready to engage with you, and together develop these solutions, for the benefit of your organization and the banking industry as a whole.

## **Annex 1: The global financial crisis**

A selection of documents on the causes and consequences of the global financial and economic crisis:

- European Commission, Economic and Financial Affairs: Economic Crisis in Europe: Causes, Consequences and Responses, European Economy 7 / 2009
- United States Congressional Research Service, The Global Financial Crisis: Analysis and Policy Implications, October 2009
- United Nations, The Global Economic Crisis: Systemic Failures and Multilateral Remedies, 2009

## Annex 2: Definitions of risks

There are many versions of the definitions of the various types of risk.

The ones used as the basis for our definition:

### **Credit/counterparty risk**

Counterparty risk is the risk that someone you deal with (a counterparty) will default on their contractual obligations resulting from a transaction, be it in full or partially. Settlement will also not happen at any time in the future.

Losses stem from outright default due to inability or unwillingness to meet commitments in relation to lending, trading, settlement and other financial transactions. Alternatively losses may result from a reduction in portfolio value due to actual or perceived deterioration in credit quality.

### **Event/Environmental risk**

Regroups all losses resulting from events, external to the transactional system itself and its participants:

- Regulatory risk: the exposure to financial loss arising from the probability that regulatory agencies will make changes in the current rules (or will impose new rules) that will negatively affect the already-taken trading positions;
- Political risk: exposure to radical changes in societal or economic stability in any given geography due to political changes;
- Reputational risk: loss of trust within the corporate eco-system that renders activity more difficult.

### **Liquidity risk**

Liquidity risk is the risk for loss that a financial institution incurs because it does not have sufficient liquid funds to enable it to meet its obligations as they fall due, or can secure them only at an excessive cost.

Four types of liquidity risk can be identified:

- Transactional or short term liquidity risk: likelihood that a bank cannot fulfil payments or trading obligations as and when they occur (securing payments);
- Market liquidity risk: risk that the market on which liquid assets need to be exchanged is no longer sufficiently working, making execution of borrowing or trade impossible. Market liquidity risk can arise from a special event (e.g. 9/11) or a lack of available buyers/sellers to maintain a liquid market (e.g. CDO market in 2008 crisis);
- Tradability risk: likelihood that specific assets are no longer accepted for trading at normal conditions, making the liquidation of existing stock impossible;
- Funding or long term liquidity risk: risk that a bank loses capacity to ensure long term funds, at appropriate terms to support current operations and structural growth. Funding risk can result from three sources: wholesale or interbank funding risk, retail funding risk, or balance sheet mismatch.

### **Market risk**

Market risk is the risk that the value of on- and off-balance sheet positions of a financial institution will decrease due to movements in market factors.

The main standard market risk factors in the transactional business are:

- Equity risk, the risk that stock prices will change;
- Interest rate risk, the risk that interest rates will change;
- Currency risk, the risk that foreign exchange rates will change.

Market risk has a strong and immediate impact on value of collateral used to guarantee transactional systems.

### **Operational risk**

Operational risk covers the entire range of failures in the operational part of transactions business, stopping the system from executing transactions as planned or adding unwanted consequences to executed transactions. We distinguish three types of operational risk:

- Operations risk: includes possibility of process breakdowns, system shut down, but also fraud or default in supply chain (e.g. electricity black-out);
- Legal risk: liabilities incurred through the execution of transactions or inability to fulfil a signed contract;
- System risk: problems that result for technology issues, system capacity, connectivity or data integrity.

### **Settlement risk**

Settlement as a particular form of counterparty credit risk arises from a non-simultaneous exchange of payment, where a counterpart does not deliver a security or its value in cash as per agreement after the other counterparty already delivered its side of the trade i.e. the security or cash value.

## Annex 3: Liquidity risk regulation

A selection of key (self) regulation initiatives, documents and resources:

### Global - public

BCBS - Basel Committee on Banking Supervision

<http://www.bis.org/bcbs/index.htm>

Back in February 2000, the Basel Committee on Banking Supervision (BCBS) of the BIS published the “Sound Practices for Managing Liquidity in Banking Organisations”. In May 2006, the BCBS published “The management of liquidity risk in financial groups” together with the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS). In December 2006, the BCBS established the Working Group on Liquidity. In September 2008, the BCBS issued 17 “**Principles for sound liquidity risk management and supervision**” for banks and supervisors. Subsequently, the “**Enhancements to the Basel 2 framework**” were published in July 2009, and banks are expected to comply by December 2010. Following a comprehensive review in September, two consultative documents were issued in December 2009 as “**International framework for liquidity risk**” and “**Strengthening the resilience of the banking sector**” for review by 16 April 2010. In January 2010, the Group of Central Bank Governors and Heads of Supervision, the oversight body of the BCBS, requested the Committee to deliver a fully calibrated and finalised package of reforms by the end of 2010 “to be phased in as financial conditions improve and the economic recovery is assured with the aim of implementation by the end of 2012”. The BCBS will conduct a **quantitative impact study** in the first half of 2010.

FSB - Financial Stability Board

<http://www.financialstabilityboard.org/>

In November 2008, the G20 declared at its **initial meeting in Washington**, based on the recommendations from the report by the Financial Stability Forum (FSF) of April 2008, to “enhance our cooperation and work together to restore global growth and achieve needed reforms in the world’s financial systems”. At its London summit in April 2009, the G20 re-established the **Financial Stability Board (FSB)** as successor to the FSF. The report of the FSB led to the launch of a new **Framework for Strong, Sustainable and Balanced Growth** – announced at G20 Pittsburgh summit in September 2009. In November 2009, the FSB released four reports as update to the progress report. In January 2010, the FSB launched a **Framework for Strengthening Adherence to International Standards**, where its member countries commit to implementing international financial standards, disclose their level of adherence and undergo periodic peer reviews.

### US

Interagency Guidance on Funding and Liquidity Risk Management

<http://www.fdic.gov/news/news/financial/2009/fil09037.html>

In June 2009, the Office of the Comptroller of the Currency (OCC), Board of Governors of the Federal Reserve System (FRB), Federal Deposit Insurance Corporation (FDIC), the Office of Thrift Supervision (OTS), and the National Credit Union Administration (NCUA) (collectively, “the agencies”) in conjunction with the Conference of State Bank Supervisors (CSBS) issued a guidance to provide consistent interagency expectations on **sound practices for managing funding and liquidity risk**, for comments by September 2009. Subsequently in March 2010, they released the **Interagency Policy Statement on Funding and Liquidity Risk Management**.

Department of Treasury

<http://www.ustreas.gov/>

In June 2009, the Department of the Treasury issued a comprehensive “**Financial Regulatory Reform: A new foundation**” aimed at rebuilding financial supervision and regulation in the United States. In December 2009, the House of Representatives, via Frank’s Financial Services Committee passed “The Wall Street Reform and Consumer Protection” reform **bill**. The Senate in turn, via its banking committee chairman Dodd, will introduce early 2010 a **bill** to consolidate the banking supervision powers of the four existing federal banking regulatory agencies (Fed, FDIC, OCC, OTS) -

into a single banking regulator: the Financial Institutions Regulatory Administration (FIRA) – next to a Consumer Financial Protection Agency. The bill was released in March 2010 as **Restoring American Financial Stability**.

## Europe

European Commission - Economic and Financial Affairs

[http://ec.europa.eu/economy\\_finance/focuson/crisis/index\\_en.htm](http://ec.europa.eu/economy_finance/focuson/crisis/index_en.htm)

In October 2008, the need to strengthen the supervision - and its coordination - of the European financial sector was recognized by the European Council and a High Level Group set up by the European Commission. The subsequent **de Larosière report**, issued in February 2009, proposes 31 recommendations, including a fundamental review of the Basel 2 rules, the set up of a new risk council and system of financial supervisors in Europe, as well as a stronger role for the FSB and the IMF. In May 2009, the European Commission issued a communication with the details of this **new European financial supervision**. The Commission subsequently issued legislation in September 2009, which was approved by the European Council in December, to start negotiations with the European Parliament and put the framework in place during the course of 2010-2012. The new legislation will create a new **European Systemic Risk Board (ESRB)** to detect risks to the financial system as a whole with a critical function to issue early risk warnings to be rapidly acted on. It will also set up a **European System of Financial Supervisors (ESFS)**, composed of national supervisors and three new European Supervisory Authorities for the banking, securities and insurance and occupational pensions sectors. Also in September 2009, European Commission published the **Capital Requirements Directive**.

CEBS - Committee of European Banking Supervisors

<http://www.c-eps.org/>

In September 2008, the CEBS published, following its work started in March 2007, the second part of its **technical advice** to the European Commission on liquidity risk management, including 30 recommendations. In June 2009, the CEBS published its **liquidity identity card** to provide supervisors at European cross-border banking groups with a single prudential language to enable meaningful exchange of information – and in July 2009 its consultation paper on **liquidity buffers**. In March 2010, the CEBS issued draft guidelines on **liquidity cost benefit allocation mechanisms** – with feedback due by June and national supervisors expected to transpose into regulation by end March 2011. Additional detailed guidelines on liquidity risk management and supervision are expected in Q3 2010.

## UK

FSA - Financial Services Authority

<http://www.fsa.gov.uk/pages/index.shtml>

The consultation process to overhaul the UK framework of liquidity regulation started in December 2007. Several consultations papers were issued in the course of 2008 and 2009 regarding the strengthening of liquidity standards. In October 2008, the FSA was asked to “make recommendations on the changes in regulation and supervisory approach needed to create a more robust banking system for the future” and in March 2009 published the “**Turner Review**” as a regulatory response to the global banking crisis. In October 2009, the FSA published its “**Strengthening liquidity standards**” policy which came into effect on December 2009 (new systems and control requirements with immediate effect, regulatory reporting and quantitative standards will be switched-on later in 2010). Subsequently in January 2010, the FSA invited CEOs of financial firms in the UK to confirm their **compliance** by 12 February. Early March, the FSA **delayed** the implementation and said it would “not tighten quantitative standards before economic recovery is assured given that all firms were experiencing a market-wide stress” - a further announcement is expected in Q4 2010.

## Global – private

IIF - Institute of International Finance

<http://www.iif.com/>

Late 2005, the Institute of International Finance (IIF) established a Special Committee on Liquidity Risk. In March 2007, the IIF released the report “**Principles of Liquidity-Risk Management**” with more than 40 recommendations on liquidity risk management to the financial services industry and regulatory authorities. A “**Market Best Practices Report**” was issued in July 2008, setting out recommendations for firms’ governance, business practices, and day-to-day risk management. In July 2009, “RESTORING CONFIDENCE, CREATING RESILIENCE: **An Industry Perspective on the Future of International Financial Regulation and the Search for Stability**” set out Commitments addressing those aspects where improvements and enhancements are required of the industry, and Recommendations outlining the views of the IIF to the official sector. In December 2009, the IIF reported on the implementation status by its members of the best practices in “REFORM IN THE FINANCIAL SERVICES INDUSTRY: Strengthening Practices for a More Stable System - **The Report of the IIF Steering Committee on Implementation (SCI)**” set up in October 2008. In a press release issued 28 January 2010, the IIF and its members reaffirmed their strong support for regulatory reform.

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