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Liquidity: Managing an undervalued resource in banking after the crisis of 2007–2008

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**Alberto Alvarez,
Claudio Fabiani,
Andrew Freeman,
Matthias Heuser,
Thomas Poppensieker and
Anthony Santomero**

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The financial markets crisis has turned the spotlight on the basic treasury function

The credit and liquidity crisis of 2007-2008 is having significant effects on the banking industry and on economies in the United States and Europe. Although the precise long-term effects cannot yet be determined, in the short term it has become quite clear that banks' liquidity management practices need to be reviewed, not least because costs have increased in a way that could prove permanent. One of the chief problems of these practices is that they have not allowed for a transparent assessment of a bank's creditworthiness. And the lack of transparency has engendered a lack of trust. The banking sector as a whole, furthermore, has shown a reluctance to lend, caught in something like the "prisoners' dilemma" of game theory, in which no one is willing to act without knowledge of what the others will do.

In many institutions around the globe, liquidity management was monitored daily by top management during the crisis and in many instances scenarios were discussed which foresaw financial stress for the institution within weeks or even days if markets remained tight and central banks would not step in. Many banks are wrestling with the question of how they should react strategically to the new higher level of liquidity costs. They are also asking themselves how they might become more rigorous about liquidity management as a matter of management and operational discipline.

This paper summarizes our findings from working with financial institutions in the U.S. and Europe during this crisis. It is organized according to the following observations.

- **Before the crisis, banks regarded liquidity as a resource that was:**
 1. **Fairly cheap**, with costs around only 10 basis points (b.p.) in the interbank market;
 2. **Available** in significant (if not unlimited) amounts at all times in the major currencies, to all institutions with sufficient rating and/or if backed by financial assets;
 3. **An inherently low-risk activity**, because assets could be liquidated quickly or financing could be found at short notice in the event of a problem.
- **Coming out of the crisis, however, we see that none of these assumptions was true.** First, liquidity costs have significantly increased and expectations are that will stay at the new levels for the foreseeable future. In recent months credit spreads in the interbank market have increased from 10 to 50-60 b.p., and were even higher in December 2007. It is some comfort to banks that these significant additional costs can be mitigated by as much as 30-50 percent through better liquidity management: enhanced transparency and data quality, portfolio optimization and a broadening of the funding base towards innovative deposit products.
- **Furthermore, the amount of available liquidity turned out to be much less than was thought**, and banks are having to pay considerable attention to both the secured and unsecured funding markets. Unsecured interbank lending has significantly retreated. For example, the U.S. Asset-Backed Commercial Paper market as a means for short-term refinancing has shrunk by almost 30 percent since July 2007, to an outstanding volume of U.S. \$789 billion in March 2008. Even the covered bond markets have experienced significant difficulties, in particular where investors have doubts about the quality

standards of the underlying portfolios. New issue volume in the European market in the second half of 2007 was only € 98 billion, down by 32 percent compared to the first half of the year.

- **Finally, banks came to realize during the crisis that they had considerably overestimated the liquidity of their own assets.** In particular, structured credit positions (on- as well as off-balance-sheet) quickly became, and have remained, completely illiquid, and this has significantly affected banks' overall liquidity position. Without the willingness of central banks in the United States and Europe to step in with significant amounts of liquidity and accept additional types of collateral for pledging, the industry would not have been able to cope with this crisis by itself.

Strategic implications of the changed funding environment

The overall strategic implications depend on the timing and extent of market recovery. Three scenarios seem plausible. The first, which seems to have the most proponents, is a slow recovery for the next 12 months, with banks continuing to face wide liquidity and credit spreads. The second scenario, which has been widely debated by academics and media commentators, is pessimistic, seeing a contagion effect that causes not only a recession in the U.S. but a crash linked to consumer bankruptcies (e.g., due to credit card debt), surging commodity prices and imbalances in the FX market due to the structural deficit of the United States. The recession-crash in the US would be followed by a worldwide recession and hence, inevitably, by further and lengthy turmoil in financial markets. The third, more optimistic scenario assumes that central bank actions combined with moves by the big financial institutions (write-downs, transparency, raising capital/strengthening capital base) will lead the market to stabilize within the next few months. However, even under scenario 3, there will be no return to "business as usual." The strategic environment has changed. In particular, it will take time to rebuild trust-based relationships, and the reconstruction of off-balance-sheet activities is likely to be a slow process. It is conceivable that the market for loans will move towards transparency and regulation similar to the German Pfandbrief.

In our experience three areas relating to liquidity management have strategic implications for banks.

1. The most obvious is the negative effect on all intermediation or financing businesses related to the assets at the heart of the liquidity crisis since mid-2007. For U.S. banks this includes mortgage businesses both on the primary market side and also on the secondary market side (i.e., investment banking), where banks have already started significant capacity reductions.
2. Furthermore, most of the structured credit businesses in investment banking such as CDO repackaging and balance-sheet restructuring have come under intense scrutiny as the relevant investor markets have pretty much dried up.
3. Liquidity-consuming businesses are affected to the extent that they rely on short-term funding and therefore need a degree of leverage in order to be profitable, and to the

extent to which they can be funded independent of capital markets – for example, by sourcing funds from customers.

Below, we illustrate the implications of the liquidity crisis on three types of businesses: off-balance-sheet funding and securitization businesses; securities portfolios and trading businesses; and loan commitments and underwriting.

Off-balance-sheet funding and securitization businesses

- Off-balance-sheet funding of assets via special purpose vehicles has grown significantly over recent years. The Commercial Paper market emerged as the predominant short-term funding instrument for such off-balance-sheet solutions, growing overall by U.S. \$761 billion or 54 percent between January 2003 and July 2007. This allowed banks to provide large amounts of credit to borrowers with limited direct impact on their own capital and liquidity positions, but it indirectly created huge leverage and contingent liquidity commitments for the banks involved.
- Current spreads on off-balance-sheet vehicles have increased to levels that make returns unattractive for the banks setting up such structures as equity investors. For example, vehicles with an original RoE of about 20 percent are now only yielding 5 to 10 percent, and some even have a negative return after costs.
- Assuming a normalization of markets, off-balance-sheet instruments will return, but at a different scale and structure. Basel II will mean that banks are likely to be more interested in shedding higher-risk assets. Judging by current trends, the leverage ratios of such instruments will decrease and their durations will increase. Further, issuers will need to make their instruments more transparent and provide investors with more granular and timely information on the assets in the relevant portfolio. The portfolio of assets is likely to be less complex and more homogeneous. Nonetheless, investors will pay much more attention to liquidity levels and liquidity risk, as well as to credit risk caused by short-term rollover financing making more intelligent liquidity management necessary in these structures. Managed off-balance-sheet instruments have also been experiencing the negative impact of reduced liquidity on tail risk (i.e., the risk of extreme losses). Off-balance-sheet vehicles therefore might be constructed so that they do not run into excessive tail risks even when market access is restricted for several months.

Securities portfolios and trading businesses

- In many banks, trading assets have increased significantly over recent years. However, there have been different approaches to trading business and these have important implications today. Some banks, typically investment banks, have forced their trading businesses to fund themselves in secured markets, or to take expensive term funding for unsecured cash. Other players allowed their trading businesses to base their activities on short-term funding. This gave traders incentives to hold “hidden” investment portfolios that in effect supported their trading business with carry income – a client example showed that up to 60-70 percent of assets held in specific trading books were not crucial for maintaining the trading business. Efficient liquidity management ensures that this kind of arbitrage is rendered impossible.

- Banks will need to determine whether trading is viable given the increase in funding cost of up to 50 b.p. depending on the liquidity of portfolio.
 - **Central bank-eligible assets** are expected to remain unchanged because they can still be funded at attractive rates.
 - **Liquid assets** such as equities traded in major exchanges and liquid corporate bonds will have increased inventory costs of perhaps around 20 b.p. This will have different effects on different parts of the overall business. True trading businesses can cover their higher cost of funding because overall profits from market making and trading should cover the cost of carrying inventory, and there is scope to increase bid-ask spreads. The business of financing liquid assets of other banks or hedge funds will have to become more focused and needs to be repriced. A likely first step would be to raise the cost of obtaining financing by moving pricing from an overnight basis to a EURIBOR/LIBOR curve. The second step is to revise the business model, so that banks can either focus solely on short-term financing with higher haircuts (e.g., for hedge funds), or on increasing the length of financing, making better returns from 3- to 6-month financing than from shorter-term financing. Balance-sheet-intensive businesses such as tax and dividend arbitrage will be scaled back to the profitable parts, barring some dramatic improvement in market conditions. Currently they are only marginally profitable.
 - **Less liquid and illiquid assets.** The collapse of liquidity has meant that banks are carrying higher inventories and these are difficult to manage dynamically. Banks need to decide if flow is sufficient to justify the cost of holding the inventory and funding it correctly (the true cost is around 40-60 b.p.). Smaller players will have to offset the cost of the inventory through wider bid-ask spreads, while larger players have strong incentives to build flow volume to maximize inventory turnover. This will lead to a concentration of trading in these asset classes by the big players, with smaller players either leaving the market or focusing on specialist niches.

In the short-run, meanwhile, banks need to deal with the prevailing mispricing of liquidity in the market. Banks that can react swiftly may find tremendous opportunities for new business and lower-cost funding. The high level of volatility in the markets means that liquidity management needs to be much more flexible and amenable to swift action by managers. It is vital that banks have smart pricing systems that set the right incentives

Loan commitments and underwritings

Lending businesses will face higher funding costs, making funding a key differentiating capability. Those who can fund at lower cost may either enjoy the increased margin or, in a more aggressive manner, use their advantage to increase market share. In contrast to the influence they exerted in the market environment before the crisis, banks now have significant bargaining power. In the next few years well-funded and strongly capitalized players can use their balance sheets to capture market share. In effect, loans can become an anchor product that will allow the strong banks to build a strong and sticky customer base. The businesses most affected are structured finance loans, mortgage loans, consumer and SME loans, and hedge fund financing.

- **Structured finance loans** (e.g., acquisition finance, MNC syndicated loans) are going to become more expensive as the risk of not being able to offload the loans is priced into transactions. In addition, banks will seek to negotiate and write explicit liquidity options, further driving up prices.
- **Mortgage loans** will remain one of the major asset classes. However, while the simpler and more transparent instruments for mortgage financing (qualifying RMBS, covered bonds) will make a strong recovery, the less transparent and higher-leverage businesses will face a significant increase in prices. In effect, the market will split into a highly over-collateralized segment with true AAA quality, and a "junk" segment.
- **Consumer and SME loans** should face higher financing costs, but the biggest factor determining the supply of credit in these markets remains the overall economic outlook.
- **Hedge fund financing** has been one of the key revenue drivers in recent years, offering historically attractive returns even for second-tier players and also forming the basis for allocating execution business. It is already evident that hedge funds need to de-leverage. In addition they will need to achieve gearing without using too much liquidity, which will support the derivatives and structuring businesses.

Improving liquidity management

In order to manage the various businesses affected by the new market conditions and to take proper strategic decisions, banks will have to improve significantly their liquidity management systems. For an indication of how important this is, consider the mispricing caused by using historical rates as benchmark rather than current market rates (30-50 b.p.). This practice has sometimes given the appearance of profitability to lending to third parties while the bank was actually incurring a loss due to higher funding cost against the internal benchmark.

Moreover, judging from current discussions with various banks on this topic, the liquidity management practices of many banks are still far from being generally recognized and comparable. This observation is further supported by the first findings from the current McKinsey survey conducted on leading European Banks regarding their ALM/Treasury practices.

Surprisingly, management and methodology for liquidity risk seem to differ significantly across different banks. Current market practices range from fully centralized ALM/Treasury functions to highly decentralized functions, where the holding company only acts as the setter of broad guidelines. In measuring their liquidity, banks rely on different metrics – from simple balance-sheet-oriented metrics (e.g., loan to deposit ratios) to complex internal models. The differences have made it difficult for banks convincingly to communicate their liquidity position to the market, and have caused most treasurers to believe that their institution was better prepared than its competitors for the crisis, since the quality of its funding processes and position could not be objectively assessed.

A key implication in this situation is that both regulators and the industry must improve the way liquidity is measured, reported and managed in the market. All banks surveyed so far plan to upgrade their liquidity risk measurement systems. Most banks surveyed see a clear need to improve the instruments available for managing liquidity, such as through long-term options to

repo. Two likely changes in liquidity management can be expected: improved processes and tools on the one hand, and a broadening and diversifying of funding sources on the other.

Improved processes and tools

- **Market liquidity prediction.** Banks need to improve their ability to predict market liquidity. It is debatable whether market liquidity and especially a coming shock can be predicted. Empirical results are still ambiguous. Modeling contagion effects, however, is less difficult, including predictable “domino” or knock-on effects. Even though they were unable to predict the initial liquidity shock, banks that thought through the after-effects and adjusted their positions accordingly were able to reduce their losses substantially.
- **Liquidity measurement.** Banks need to create full economic transparency of liquidity, going beyond merely meeting current regulatory minimum requirements.
 - A first step in this direction is to introduce more sophisticated liquidity modeling, i.e., modelling that is more granular on the risk drivers for positions with no predetermined contractual maturity. The risk from undrawn committed lines, for example, was greatly underestimated before the crisis.
 - Secondly, the frequency of forecasts needs to be increased in many banks to a daily calculation of cash forecast to monitor liquidity with separate limits around critical resources – MM usage, funding profile, unpledged securities.
 - Thirdly, the regular stress testing of liquidity needs to include different crisis modes, so that banks can assess their resilience in the face of problems.
- **Limit system.** Banks need to develop limits and early warning indicators on liquidity usage across different businesses, to ensure that tools are in place to limit liquidity usage. Limits need to include both on- and off-balance-sheet items. Especially crucial are limits on volatile positions.
 - **Bankwide gap limits and funding concentration limits,** ensuring that an adequate liquidity structure is maintained.
 - **Limits on securities businesses,** especially securities financing business and warehousing business. Banks can apply maximum cash outflow limits per business unit, limits on use of unsecured cash, and limits on funding profiles designed to force businesses to take on an adequate funding structure.
 - **Liquidity lines and guarantees.** Limits are needed on lines to financial counterparties and vehicles that have a high correlation with the liquidity situation of the bank and overall financial markets. In the current crisis, the drawing of liquidity lines against SIVs and conduits increased way beyond the average expected drawing of 20 percent.
 - **Cost allocation.** To have an impact on the overall business, liquidity management relies on transfer pricing – the prices the treasury may charge businesses for liquidity. Currently there is much uncertainty around the question of whether and how to allocate liquidity costs. Approaches in place are based on historic information, current marginal prices or expected long-term prices. Convergence to a best-practice approach here is essential if liquidity is to be a fundamental part of transfer pricing; a best practice

approach would furthermore become a key mechanism for implementing liquidity considerations into broader industry practices.

Liquidity limit structure example

Regulatory limits	Hard limits and ratios					Decision limit adjustment
	Proposed boundaries and prudent risk management guidelines					
Bank-wide limits per legal entity	Internal-model-based measures		Balance-sheet-based ratios			Proposal by ALCO; decision by Board
	<ul style="list-style-type: none"> Cumulative gap limit (0/N, 1 w, 2 w, ...) Long-term funding limit etc. 		<ul style="list-style-type: none"> Loan-to-asset ratio Balance sheet turnover Funding volume/debt outstanding Limit on committed lines etc. 			
Operational limits for steering of liquidity risk position	Total unsecured funding limit	Max. cash outflow limit net securities	Secured funding limit	Limits on large transactions	etc.	Proposal by Treasury/ALM; decision by ALCO
Limits for trading units	Maximum unsecured funding per asset class	Maximum cash outflow security classes per desk or product	Liquidity gap profiles per desk	etc.	Set by CRO/Treasury in alignment with head of trading unit	
			<ul style="list-style-type: none"> Securities Money Market 			

Broadening funding sources

Funding costs have gone up by around 50 b.p. on short-term refinancing and up to 100 b.p. on long-term refinancing. This implies that banks must choose the funding sources they need to tap into and decide how best to gain access to them. If they are to achieve higher efficiency and more innovation in funding, banks will need an integrated product treasury. Product development will have to be driven or at least strongly influenced by its effectiveness measured against the treasury's strategic goals – a relationship that opens up considerable business opportunities. Typical areas for potential improvements would be:

- **Retail funding.** Banks are not making the most of the funding opportunity in their own customer base; besides classical deposits, the instruments under review include:
 - **Retail certificates.** Until now, banks have given up potential funding benefits by sourcing multiple certificates from other banks. An integrated product treasury will lead to greater in-house production.
 - **Retail placement of banks' covered bonds.** Treasury functions have traditionally catered primarily to institutional investors. An interesting addition is the usage of the retail network to sell a bank's own bonds.

- **Innovative deposit products** will be boosted by an integrated product treasury. This will allow banks to offer customers value-added products, while still maintaining an attractive margin compared with highly competitive money market accounts. In addition, banks can tap into customers whose assets have previously been captured by other investment products, for example savings accounts with payouts linked to gold prices or stock market performance (e.g., the “DAX-Sparbuch” offered by Postbank in Germany).
- **Professional sale of funding products.** Currently few banks have dedicated sales catering to cash-rich investors. A dedicated sales approach with adequate incentives is needed to sell the traditional “low-margin” business.
- **Strategic funding profile.** Historically most banks have operated with static funding profiles, but these are no longer appropriate. Banks need a more dynamic approach, partly to ensure that they have sufficient and stable funding in place to survive a liquidity crisis of the kind observed over the last year, and partly to make sure that they do not get locked into today’s distressed funding spreads by funding everything in matched maturity as before. An example of a dynamic profile might involve concentrating a majority of funding in the 1- to 2-year bucket, allowing for reduced dependence on the money market (under 1 year). If spreads tighten in the future then funding should be lengthened potentially beyond the minimum needed to meet internal or external limits as a liquidity buffer. A sample calculation shows that such a conservative profile costs around 6-10 b.p. more in a stable environment, but, crucially, saves up to 20-30 b.p. in a stressed environment.

Obviously, broadening the sources of funding requires significant investments in infrastructure, management resources and capabilities, in particular around the treasury function. However, given the liquidity costs and strategic implications, investment costs of between € 5 million and € 20 million seem adequate against additional liquidity cost charges to be allocated, which would range between € 50 million and € 200 million per annum even for large and mid-tier national banking players (equivalent to 20 b.p. increased average charges on a balance sheet of € 20 million).

Anticipating the regulatory response

The issues raised in this paper are not news to regulators worldwide. Recent events have demonstrated that both industry practices and regulatory mandates were inadequate for dealing with circumstances that result in a sudden and massive decline in liquidity. Just as the industry has responded by rethinking its liquidity management policies, regulators have been seeking lessons from the current credit and liquidity crisis. Prescriptions will follow. Responses will surely be seen in regulation at the national level as well as in regulation associated with international agreements such as the Basel II standards for capital adequacy.

Most recently, the Senior Supervisors Group has issued a report on recent events that focuses on disclosure, while the Financial Stability Forum has responded to the G-7’s request for a review of the crisis with recommendations focusing on strengthening prudential oversight of capital, liquidity and risk management. It is further expected that the Basel agreement will be

amended, in part in response to the current environment, to add greater emphasis on liquidity management and additional stress testing.

Actions taken by the industry in response to shortcomings exposed by the current crisis will only aid in its future attempts to satisfy possible new regulatory mandates. In short, a plan of remediation now will make the industry more robust and put it in a better position to respond to regulators' concerns about industry preparedness for the next financial stability crisis.

How to think ahead

Banks will not find it easy to address these questions, least not because of increasing budget and management constraints. However, alongside better capital management, banks will crucially need improved liquidity management, both to survive the crisis in the short term and to position themselves for fierce competition in the coming years. Liquidity management will help determine success for banks, in what will be a struggle for M&A and asset market share; and it will also determine the extent to which already emerging short-term opportunities can be grasped. The overall treasury function has thus once again become a key strategic element in both commercial and investment banking.

With systematic reviews of their liquidity management, some leading banks are already beginning to position themselves, and more are planning an overhaul of their liquidity function in the near future. Not only can such programs cut the cost of the crisis by as much as half, they also have the potential to help position a bank strategically. During the present crisis, as banks simply tried to understand what was happening, precious time was lost that might have been used to undertake systematic actions to mitigate their woes. A sophisticated and transparent liquidity management system can help banks avoid future surprises.

Alberto Alvarez and **Thomas Poppensieker** are principals within McKinsey's Global Risk Management Practice in Dubai and Munich, **Andrew Freeman** is a Risk Practice senior knowledge expert based in the London office, **Anthony Santomero** is a senior advisor in the Risk Management Practice in New York, **Claudio Fabiani** and **Matthias Heuser** are associate principals in the Risk Management Practice in Rome and Hamburg. The authors would like to thank Stephan Simon, Konrad Richter and Erik Lüders, engagement managers and experts from McKinsey's Risk Management Practice for their support in developing this paper and in conducting the 2008 ALM/Treasury survey.

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McKinsey & Company,
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Martin_Pergler@mckinsey.com

Anthony Santomero

Senior Advisor

McKinsey & Company,
New York

Anthony_Santomero@mckinsey.com

