

# Preserving financial stability, liquidity and capital management conditions

**Bob Currie** reviews policy lessons that can be drawn from the global financial crisis and implications for supervising capital and liquidity adequacy



For almost a year and a half the global financial system has been under extraordinary stress – stress that has now decisively spilled over to the global economy more broadly. The proximate cause of the crisis was the turn of the housing cycle in the United States and the associated rise in delinquencies on subprime mortgages, which imposed substantial losses on many financial institutions and shook investor confidence in credit markets. However, although the subprime debacle triggered the crisis, the developments in the US mortgage market were only one aspect of a much larger and more encompassing credit boom whose impact transcended the mortgage market to affect many other forms of credit.

... The abrupt end of the credit boom has had widespread financial and economic ramifications. Financial institutions have

seen their capital depleted by losses and writedowns and their balance sheets clogged by complex credit products and other illiquid assets of uncertain value. Rising credit risks and intense risk aversion have pushed credit spreads to unprecedented levels, and markets for securitised assets, except for mortgage securities with government guarantees, have shut down. Heightened systemic risks, falling asset values, and tightening credit have in turn taken a heavy toll on business and consumer confidence and precipitated a sharp slowing in global economic activity. The damage, in terms of lost output, lost jobs, and lost wealth, is already substantial.

*Ben S. Bernanke, 'The crisis and policy response', Stamp Lecture, London School of Economics, 13 Jan 2009*

# Stability amid the storm: Investment in volatile market

Few can doubt the severity of the global financial crisis witnessed during the past 18 months. During the earlier stages of the financial maelstrom back in Q3 2007, a senior risk manager at a leading transatlantic investment bank reported that his team was witnessing 25 standard deviation (SD) moves on several days consecutively. Assuming a normal distribution, a 7.26 SD daily loss might be expected to arise once every 13.7 billion years or so – roughly the estimated age of the universe. A 25 SD event would be expected to occur every  $6 \times 10^{14}$  lives of the universe. Andrew Haldane, Executive Director for Financial Stability at the Bank of England, quips that when he tried to calculate the probability of a 25 sigma event taking place on several consecutive days, lights dimmed over the city of London and his computer rejected the challenge.

the public authorities are struggling to retain their dignity with a mixture of sack-cloth and fig leaf.

This said, if a period of financial stability is sufficiently long, it becomes ever easier to persuade the attendant crowds that one is not standing naked. The long decade of economic prosperity between October 1998 and June 2007 saw banks' balance sheets expand more than 300 per cent and their share prices increase more than 60 per cent. With hindsight, the stress tests demanded by financial authorities in the lead up to the current crisis were heavily shaped by behaviour, and driven by time series data, from what Haldane calls this 'golden decade'. Comparing the distribution of a set of financial and macroeconomic variables over this decade with that for a much longer historical

It is apparent that at an academic level the industry still does not fully understand the mechanisms that enabled the credit bubble to expand to such major proportions. Looking back 3-4 years, central bankers were focused on monitoring a series of risks that posed threats to financial stability - but the general view was that these risks were well mitigated by a banking system that was strongly capitalised. With hindsight, it appears now that the industry was not capitalised sufficiently well to manage the series of shock events of the magnitude that we have witnessed during the past six months.

But, notes Haldane, a more probable explanation as to why tail events with such low probability of occurrence might arrive in practice on several consecutive days was that, ultimately, the financial model was wrong. Haldane argues, in a thought provoking paper, that 2008 may be remembered as the year when stress-testing failed. Estimated losses in the financial sector since the start of the financial crisis lie somewhere between a large number and an unthinkable large one (see also *FSR*, 'To the nearest half trillion', Q2 2008, pp 4-7). And, currently, risk managers in both the banking sector and

time series (for some variables spanning several centuries) it is evident that distributions for the golden decade have much tighter variance and slimmer tails. Haldane notes that the long-run SD for UK GDP has on average been 400 per cent higher than for the golden decade, 500 per cent greater for unemployment, 700 per cent higher for inflation and 1200 per cent greater for earnings.

More specifically, the Financial Services Authority (FSA) required UK firms to simulate the impact of a 1-in-25 year stress as part of Basel II capital ad-

equacy estimates. In 2007, the most acute impact estimated for GDP growth over the preceding 25 year period was -1.4 per cent. For the full sample, the average 1-in-25 year stress was almost three times as high, at -3.8 per cent. In short, one of the quantitative effects of this disaster myopia was that the price of risk was set too low prior to the crisis – and this was key in establishing the conditions for the credit boom. Haldane estimates that if we were to assume that the Golden Era distribution was the true one, the three worst monthly returns in history – the bursting of the South Sea bubble in September and October 1720 and Black Monday in October 1987 – would have been 12.7, 6.9 and 6.5 sigma events respectively. According to this estimate, each of these events would be expected to occur once in the lifetime of the universe.

### Managing and supervising liquidity risk

But how will these messages translate into concrete responses from policy makers and financial supervisors designed to tighten the rigour with

The financial crisis that has developed since mid-2007 has illustrated the degree to which liquidity considerations influence the functioning of financial markets and the banking sector. Prior to this point, asset markets were vibrant and funding was readily available at low cost. The upheaval in market conditions confirms that liquidity can dry up extremely quickly and that illiquidity can last for an extended period. The banking system came under severe stress, requiring that central banks intervene to support the functioning of money markets and, in several cases, individual institutions.

In providing protection against these risks, the Basel Committee specifies that a bank should incorporate liquidity costs, benefits and risks into the internal pricing, performance measurement and new product approval processes for all significant business activities, both on- and off-balance sheet, thereby aligning the risk-taking incentives of individual business lines with the liquidity risk exposures these activities create for the bank as a whole. In line with this commitment, senior man-

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which firms model their risk exposure and maintain effective buffers of capital and liquidity?

For the Basel Committee on Banking Supervision, liquidity is a measure of a bank's ability to fund increases in assets and to meet obligations as they fall due, without incurring unacceptable losses. Efficient liquidity risk management is important in protecting a bank's ability to meet its cash flow obligations, which will fluctuate according to external events and other agents' behaviour. The elemental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks vulnerable to liquidity risk, both at an institution-specific level and through constraints that affect markets as a whole. And these risks are closely interlinked given that, as we have seen in recent times, a liquidity shortfall at a single firm can have system-wide implications. Virtually every financial transaction or commitment has implications for a bank's liquidity.

agement should review information on the bank's liquidity position and report to the board of directors on a regular basis. A bank's board of directors should review its liquidity management strategy at least annually and ensure that senior management manages liquidity risk effectively (Basel Committee on Banking Supervision, *Principles for Sound Liquidity Risk Management and Supervision*, BIS, Sept 2008, principles 3- 4).

In modelling liquidity adequacy, the Financial Services Authority in the UK has opted for an Individual Liquidity Adequacy Standards (ILAS) approach, recognising that one-size-fits-all quantitative regimes are often inadequate to capture the particular circumstances of individual firms. In reviewing its approach to liquidity risk management supervision, the FSA has made public its concerns that the methodology it has adopted in the past has placed too much reliance on firms meeting quantitative targets: as long as the specified quantitative ratio

## The right prescription? Rethinking approaches to liquidity management supervision

In formulating its supervisory regime, the UK Financial Services Authority (FSA) has questioned whether it should adopt a prescriptive approach to monitoring liquidity risk. The advantage, it notes, is that this will help the FSA to draw consistent comparisons across firms' liquidity profiles and it will avoid the risk of creating an uneven playing field through firms not applying stress tests properly. This may also reduce risk that firms will manipulate assumptions and mis-report their liquidity profile in order to gain competitive advantage.

However, on the downside, the FSA believes that a one-size-fits-all approach may present a misleading picture of liquidity risks that firms are actually running since this assumes that firms are all running the same risks. Second, there is a danger that prescriptive approaches may fail to capture key elements of a firm's liquidity risk profile as financial innovation is introduced. For example, some prescriptive liquidity regimes were developed before off-balance sheet activities (in relation to OTC derivatives or special-purpose entities for example) play as prominent a role as they do now. Third, there may be real benefit in encouraging dialogue between firms and their financial supervisors, as required when firms conduct a regular ILAA.

With this in mind, the FSA favours a middle-ground between these positions, where it aims not to be overly prescriptive by taking firms straight to the answer, but also not to be excessively flexible in extending scope for uneven implementation of the FSA's risk appetite. In the short term, the regulator will expect the mismatch of short-term outflows to be covered by a buffer of liquid assets.

The FSA proposed in an earlier discussion paper (DP 07/7) that it saw no reason why its risk appetite for liquidity regulation should differ to that for solvency, working on the basis that liquidity risk could be expressed statistically using a probabilistic method as it does for capital adequacy. This approach was strongly opposed by firms that responded to the paper. Respondents indicated that liquidity stresses are typically low-frequency high-impact stress events which are idiosyncratic in nature. Thus, any statistical model using historical data to predict estimates of future liquidity requirements at a given level of confidence is unlikely to be reliable.

was attained, a firm's liquidity risk was seen to be effectively mitigated.

Under the ILAS regime, the FSA will require a firm to conduct an individual liquidity adequacy assessment of the type and quality of liquidity resources that it should hold to protect against liquidity risk under specified stress scenarios. In keeping with the Basel Committee principles outlined above, these are: (i) idiosyncratic liquidity stress; (ii) market-wide liquidity stress; (iii) a combination of idiosyncratic and market-wide stress.

*Idiosyncratic liquidity stresses* – are those where the market or retail depositors believe that a firm will be unable to meet its liabilities as they fall due. This may be followed by a period of long-term stress that might result (for example) in a multi-point downgrade of its credit rating – triggering potential for further loss of confidence in the firm and additional problems in meeting its liabilities owing to the liquidity stresses that this might precipitate.

*Market-wide liquidity stresses* – are those prompting widespread concerns about the solvency of financial-sector firms and uncertainty about the value of financial assets. As a result, there may be a high level of illiquidity in FX markets, particularly in FX swaps, and some asset

classes (especially those linked to the financial sector) may remain illiquid for an lengthy period or may be realisable only at excessive cost.

To guide firms in preparing their ILAS, the FSA highlights 10 primary sources of liquidity risk, specifically: wholesale funding risk; retail funding risk; intra-day liquidity risk; intra-group liquidity risk; cross-currency liquidity risk; off-balance sheet liquidity risk; franchise-viability liquidity risk; liquidity risk pertaining to either marketable or non-marketable assets; and funding diversification risk. Selecting elements from this list, the FSA points out that wholesale funding risk is likely to result in instances where a firm's credit rating is subject to downgrade and credit sensitive depositors (this may, for example, be local authorities, pension and insurance funds, sovereign or government-sponsored agencies, money market funds etc) may decide to rein back their funding. The risk may be particularly high for funding obtained through unsecured debt instruments (certificates of deposit, medium term notes, floating rate notes, commercial paper) – which may become limited or unavailable under one or more of the stress scenarios – and funding from counterparties with relatively low creditor seniority on the liquidation of the firm.

In monitoring its intra-day liquidity risk, a firm

must have appropriate procedures in place to forecast net collateral requirements to cover all *expected* activity in payment systems; along with the ability to model *unexpected* movement in timing and volume of these collateral requirements under stress conditions. These respective exposures must each take into account potential intra-group liquidity risk, resulting from a firm ceasing to receive funding from (or needing to provide additional funding to) other group members. In modelling its off-balance sheet liquidity exposure, a firm must detail all off-balance sheet activities that might affect its cash flows (this might include proprietary derivatives positions, contingent liabilities and liquidity facilities designed to support securitisation programmes) in order to estimate how these cash flows might change unexpectedly under the liquidity stresses highlighted.

On the basis of the ILAA forwarded by the firm, the FSA will issue an individual liquidity guidance (ILG), proposing what it believes to be an appropriate liquidity profile for the firm and a range of metrics that will guide the firm in monitoring its liquidity strategy. This will include guidance on the minimum level of liquid assets that the firm is expected to hold. In fulfilling this strategy, firms will be expected to hold a buffer of highly liquid, high quality assets as a secure line of defence, should

they experience problems in accessing alternative sources of funding and asset sales in instances of idiosyncratic or market-wide stress. This will also help to fulfil another important responsibility of liquidity regulation, namely to limit risk of moral hazard – the risk that firms might engage in imprudent risk management and hold reduced levels of liquidity because they anticipate that central banks will come to their rescue in instances of liquidity shortfall (see box below).

The requirement that firms hold a solid buffer of liquid assets is one mechanism designed to encourage prudent liquidity risk management. However, the FSA is at pains to emphasise that this liquid assets buffer is one component of a sound LRM strategy, but by no means the most important component. The first line of defence will be for firms, on the basis of rigorous stress testing, to develop funding strategies that contain the impact of stress on their balance sheets. This will limit the need for firms to liquidate assets in the market or with the central bank in a real stress scenario.

In aggregating this information at industry level, the FSA is weighing up the benefits of publishing an annual liquidity risk review that will present a consolidated picture of the industry's liquidity position and how this might be expected to move over time.

## **A cautionary tale from regulator and central bank**

...These days, if a bank owes a small amount it is their problem, a large amount it is the authorities. This time-consistency problem weakens incentives for banks to consider for themselves large-scale risks to their balance sheet which might induce failure. The safety net becomes a comfort blanket, the backstop a balm. And the greater the risk these institutions themselves pose in the event of failure, the weaker the incentives to manage risk. These are topsy-turvy incentives from a public policy perspective, with risk management discipline weakest among those whom society would wish it to be strongest.

And the evidence? A few years ago, ahead of the present crisis, the Bank of England and the FSA commenced a series of seminars with financial firms, exploring their stress-testing practices. The first meeting of that group sticks in my mind. We had asked firms to tell us the sorts of stress which they routinely used for their stress-tests. A quick survey suggested these were very modest stresses. We asked why. Perhaps disaster myopia – disappointing, but perhaps unsurprising? Or network externalities – we understood how difficult these were to capture? No. There was a much simpler explanation according to one of those present. There was abso-

lutely no incentive for individuals or teams to run severe stress tests and show these to management. First, because if there were such a severe shock, they would very likely lose their bonus and possibly their jobs. Second, because in that event the authorities would have to step-in anyway to save a bank and others suffering a similar plight. All of the other assembled bankers began subjecting their shoes to intense scrutiny. The unspoken words had been spoken. The officials in the room were aghast. Did banks not understand that the official sector would not underwrite banks mismanaging their risks? Yet history now tells us that the unnamed banker was spot-on. His was a brilliant articulation of the internal and external incentive problem within banks. When the big one came, his bonus went and the government duly rode to the rescue. The time consistency problem, and its associated negative consequences for risk management, was real ahead of crisis. Events since will have done nothing to lessen this problem, as successively larger waves of institutions have been supported by the authorities.

*Andrew Haldane, Executive Director for Financial Stability, Bank of England in a paper entitled 'Why Banks failed the Stress Test', BoE, 13 February 2009*



**Diana Chan,**  
Chief Executive, EuroCCP

### Promoting enterprise-wide risk awareness

In line with the agenda mapped out above, *FSR* questioned a number of senior risk management professionals across the financial services industry regarding how they had refined procedures for managing credit, liquidity and operational risk in light of the volatile global market conditions evidenced from mid-2007.

Roland van der Baan, Head of Risk Management at KAS BANK, responds that his team has been working to improve levels of risk awareness across the organisation in each of these areas. "As a bank specialising in asset servicing, we have a sizeable body of staff monitoring operational risks, but it is crucial in volatile economic conditions also to understand the credit risks and liquidity risks deriving from these operational processes," he says. With this in mind, an ongoing priority for KAS BANK's risk management division has been to advance levels of bank-wide risk awareness.

As part of this programme, KAS BANK is reviewing the stress testing techniques that it has in place to identify key sources of risk and how they should be mitigated. "Employing what some risk managers have labelled a reverse stress testing methodology, we have started by asking the question, 'Which sources of risk will really hurt us?'," explains van der Baan. "On drawing up a priority list, we are making sure that we have appropriate risk metrics in place to monitor any sharp increase in our risk exposure and to guide preventative measures."

One risk avenue highlighted through this review process has been the need to ensure appropriate controls around payments and asset transfers that are processed through automated channels. For instance, the state-owned German bank KfW made an automated payment of €300 million to Lehman Brothers in unwinding a current swap agreement on the day that Lehman filed for Chapter 11 bankruptcy protection. "This situation illustrates that, while it is important to optimise STP rates in payments and securities processing, it is crucial to have effective risk oversight sitting around these automated procedures," says van der Baan. "At KAS BANK, we have reviewed our securities processing and treasury functions to ensure that we can manually block or delay any automated transfer in any situation where it may be inappropriate to transmit cash or securities to an external counterparty."

Much attention has been directed to managing market risk and credit risk during the credit crisis. However John Trundle, Managing Director and Head of Risk Management at Euroclear, notes that this period of market volatility has also presented significant challenges in terms of managing operational risk. In September 2008, Euroclear UK & Ireland witnessed record settlement volumes, with peaks of 1.6 million transactions. This was more than double the largest peaks that it had witnessed previously and several times the daily average. "Although our systems coped efficiently with these spikes in volume, it did prompt us to boost the processing capacity that we could support on our platform, ensuring that we have greater headroom in order to cope with even larger peaks of intense trading that we might encounter in the future," says Trundle. This focus on operational capacity is integral to Euroclear's medium-term planning. "Although levels of redundancy in our systems have been more than adequate to cope with peak volumes that we have experienced in the past, we are aware that there can be significant lead times involved in adding new computing capacity to our systems. Thus, we were keen to take immediate action in advance of any future surges in activity."

### Understanding clearing risk

Appetite for bilateral risk taking across European trading markets has fallen substantially as firms' ability to put up risk capital to support their trading activities has diminished. This has worked to the advantage of execution venues that have central counterparty clearing facilities in place since the CCP framework offers a high level of surety in managing a possible default and efficiency benefits in, for example, managing margin requirements.

But Diana Chan, Chief Executive of DTCC-owned central counterparty EuroCCP, warns against assuming that central clearing is a universal solution for counterparty risk. "Subsequent to the credit crisis, we welcome the drive from national regulators to encourage market participants to clear trades through a central counterparty," says Chan. "However, we believe that there is need to reinforce education around the types of assets and transactions suitable for central counterparty clearing, and the potential risks and benefits attached to using a CCP. Generalised adoption of CCP clearing will not provide a universal panacea for all credit risks prevailing in financial markets. A CCP can only provide effective risk management when it can price instruments accurately, thereby allowing it to collect an appropriate level of margin

and to manage margin calls in line with price movements for that instrument.”

Also, it is important that instruments cleared by a CCP have a required level of liquidity, thus ensuring that the CCP can close out a position without delay in case of default. The margin collected by the CCP must take into account the price volatility of instruments in the portfolio across the specified liquidation period. If an instrument has high price volatility, or if the liquidation period must be extended because the portfolio contains illiquid instruments, then the CCP must collect a higher level of margin to cover the associated risk. The benefits of using a CCP are magnified if the market is characterised by a number of players who trade among themselves a specific group of identical instruments, so that a large number of trades can be legally netted down into a very small

that they extend to the counterparty. As a consequence, customers require efficient procedures for managing these funding arrangements, including collateral movements across multiple markets and businesses (whether to support central bank credit operations, securities lending and repo arrangements, derivatives trading and so on).

In the current economic climate, Euroclear's John Trundle indicates that collateral takers have become more restrictive in the range and quality of collateral they will accept – and when lower-grade collateral is accepted, often complex haircut structures and concentration limits will be applied. In this environment, Euroclear Bank has seen a tangible rise in the range of customers interested to use its tri-party collateral management facilities. In extreme situations, such as when a counterparty defaults, a tri-party service will enable

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number of obligations. Netting reduces the level of financial exposure as well as operational risks.

Taking these criteria collectively into consideration, EuroCCP is firm in its view that not all instruments can be cleared efficiently and safely via a central counterparty. In situations where inappropriate instruments (typically illiquid instruments that may be subject to high price volatility) are pushed through a central clearing facility, this is likely to accentuate risks for the market because the failure of the CCP would re-expose the trading parties to risks they thought they no longer had.

### **Intra-day liquidity and collateral requirements**

The extension of DvP and real-time gross settlement models has reduced credit risks attached to payment and settlement operations, but this development has accentuated demand for intra-day liquidity. Central banks have extended intra-day credit facilities to cover these obligations, typically taking high quality collateral against the funding

the client to make an early assessment of its level of exposure and to move quickly to liquidate collateral. This substantially reduces the risks borne by the customer when compared with managing these contracts bilaterally. At the end of 2008, the Euroclear group had more than €18 trillion assets in depot, with roughly half of this figure accounted for by Euroclear Bank. Currently, Euroclear Bank's tri-party collateral business is approximately €330 billion in size, with this amount growing rapidly.

More broadly, the crisis has reinforced the importance of efficient liquidity management for financial institutions, corporates and government bodies. Given its banking model, Euroclear Bank is typically long in funds – and it makes extensive use of overnight repo arrangements with high quality counterparties, and selective use of central bank facilities where these are available, to ensure that its treasury activities remain secure and are managed efficiently. This requirement has been particularly important during the credit crisis where, Trundle adds, many organisations have



**John Trundle,**  
Managing Director and Head of  
Risk Management, Euroclear

sought a safe location such as Euroclear Bank in which to retain their funds.

KAS BANK has maintained a high level of solvency throughout the credit crisis and, over many years, has represented a net provider of liquidity to the markets. Roland van der Baan indicates that KAS BANK's solvency is well above both the externally-dictated minimum of 8 per cent specified by the Bank of International Settlements, and its own internally-set minimum level of 12.5 per cent, and is strongly backed by Tier 1 capital. The bank's liquidity surplus over and above the required minimum threshold is currently €1.5 billion.

At the height of the market turbulence, KAS BANK opted to place almost all of its liquidity with the Dutch Central Bank on deposit and it continues to rely heavily on this avenue as a safe haven for cash balances. This trend is widespread across the banking sector in the Netherlands and many other European countries. Although the ECB has introduced injections of liquidity and other measures designed to revitalise interbank lending, van der Baan observes that, in practice, these interventions have had little lasting impact on banks' willingness to lend to each other. A high level of distrust still prevails regarding the actual solvency and liquidity position of other banks in the market – and funds have continued to pour back towards the Central Bank, despite a sharp contraction in the returns that it is paying on cash deposits.

In light of the financial crisis, financial supervisors are now taking a closer interest in firms' liquidity positions – requiring tighter quantitative assessment of their liquidity ratios, supported by stress testing. Many firms assumed in more favourable economic conditions that they were holding assets that they could turn into cash with little difficulty – but as liquidity rapidly left the market, this has often proven not to be the case.

In light of recent experience, many financial organisations are taking the need to model extreme events more seriously. In a quarterly assessment of financial strength within the Dutch economy, the Dutch Central bank ran a scenario analysis prior to the deepening of the financial crisis where it assumed a sharp contraction in liquidity across wholesale money markets. Although at the time this analysis was accorded little importance by many within the Dutch financial sector, in reality this scenario analysis modelled a number of the risks subsequently experienced since Q3 2007

when we have seen a progressive contraction in liquidity across this sector. In future, van der Baan predicts that we can expect financial supervisors to require financial institutions to model their risk exposures more thoroughly in instances of high illiquidity, taking into account that this may result in unusually strong correlations between underlying factor inputs.

### **Reviewing safety of cash and securities**

In light of global economic instability during Q3 2008, with Lehman Brothers passing into administration and other major firms encountering financial difficulties, it is evident that no company is immune to counterparty credit default risk. This has prompted many asset management customers to review arrangements that they have in place for safekeeping their securities holdings and cash balances, ensuring that their assets are fully protected and that they can move their custody relationships quickly should this be necessary.

Ron Tannenbaum indicates that GlobeOp has played an important role in helping buy-side customers to manage these considerations. For example, in September 2008, it facilitated requests from its hedge fund client base to move 180 prime brokerage relationships within a two-day period. Buy-side customers wished to avoid being in a situation where cash or securities were locked up with a prime broker that might threaten to go into default – or where the fund had more collateral held with the PB than was necessary to cover current exposures. "At GlobeOp, we have an operational platform that is sufficiently robust to be able to move the client's custody relationship across from one provider to another with no other disruption to that customer's business activities," he says.

Also, as concerns developed in December 2008 around investment losses from Madoff-related events, GlobeOp witnessed a rise in demand from buy-side customers for independent daily reconciliation of their assets and their cash. "Investors now need to know that the fund's assets (ie their investment) is still there," says Tannenbaum. "A fully daily reconciliation of every security and cash flow with every client counterparty and prime broker or custodian is exactly what GlobeOp is all about." Following the events of December, there has been a significant increase in investor pressure on hedge fund customers to be more transparent about how they are doing their full set of reconciliations. This development reinforced to fund

investors the importance of conducting thorough due diligence on the fund accounting, custody and auditing procedures that a manager has in place. Recognising that, outsourcing to a third-party fund administrator that can provide independent valuation and reconciliation is a crucial step to ensuring transparency around the investment process.

At the end of 2008, Union Bancaire Privée (UBP) issued a letter to its customers in which it outlined that it would no longer invest in any hedge fund that did not employ an independent fund administrator. For UBP to retain full confidence in their investment managers, they are insisting on a full separation of powers between the manager, the custodian (or prime broker), the broker/dealer and the fund administrator. Within three days, Millennium – one of the funds named by the UBP letter as being self-administered – appointed GlobeOp to provide independent administration services, including cash and position reconciliation, independent pricing and valuation, NAV calculation and financial reporting. The new mandate

a secure environment. Some of these transfers were executed under stress, creating a requirement for retrospective due diligence on these new arrangements.

Asset managers are increasingly looking into ways in which they can secure safe custody of their assets using custodians and prime brokers, using each one for the services in which they specialise. The challenge that asset managers face is how to do this while taking into account the new products prime brokers are developing in the short to medium term. These offerings represent prime brokerage's response to the increased asset protection levels that hedge fund managers are demanding.

### Giving up on prime broker give ups?

In the aftermath of credit events in recent quarters, a number of prime brokers are looking to limit or discontinue the OTC derivative assignments, or 'give up', services that they previously extended to their hedge fund customers. Under



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Co-Founder, GlobeOp Financial Services

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expanded upon valuation, share registry and transfer services GlobeOp had provided since 2006 to the Millennium International fund.

Chris Day, Senior Consultant at Carne Group, reflects similarly that the arrangements hedge funds have with service providers have been subject to heightened scrutiny following the collapse of Lehman Brothers. Subsequently, most funds looked into their arrangements with their prime broker, focusing on the organisational and legal structure governing the security of their physical assets and cash. Post-Lehman, those prime brokers and custodians that were perceived to be in a stronger position benefited from an inflow of assets from funds looking to move assets into

this facility, counterparties to a derivative contract would typically assign (or 'give up') their execution commitments to the prime broker who would write trade tickets on behalf of both parties. As concerns about risk exposure to single prime broker relationships increased during Q3 2008 – prompting fears that cash and securities might be locked up at the prime broker, should it become insolvent – buy-side customers opted to reduce or avoid the concentration risk inherent in give-up agreements. They began to explore alternative avenues for meeting their requirements for execution, leverage and cross-margining.

Hans Hufschid, CEO of GlobeOp, observes that "intense revenue pressure on banks and on credit

risk overall is now forcing banks with prime broking activities to take a very tough approach to profitability. Give ups were, for many, never a core business, used to support the more profitable activity of lending securities to hedge funds. As risk tolerances and the lending business have become less attractive, the motivation for providing low or non-profitable support services such as give ups are falling away."

For GlobeOp, an implication of this trend is that many buy-side firms are looking for efficient, low risk alternative avenues through which they can outsource the execution, credit intermediation and collateral management obligations that they previously met through their prime broker. This has translated into significant interest from hedge fund customers in the integrated GoOTC service, through which funds can outsource their OTC derivative trade processing operations, collateral management, valuations and reporting requirements to GlobeOp at little additional cost above what they may already be paying for their fund administration.

In handling the assignments process, buy-side firms are under pressure to set electronic procedures in place in advance of the 28 February 2009 deadline agreed by the Operations Management Group (OMG) with the Federal Reserve Bank of New York. After that date, major dealer firms have said they will no longer accept novation consents by email. This will encourage industry participants to link to electronic novations platforms such as those offered by DTCC Novation Consent and TZero Goldsync+. GlobeOp provides its clients with a direct, real-time link to DTCC, that enable clients to execute novations electronically and remain fully integrated with the administrator's straight-through-processing (STP) into trade booking, accounting, risk and other systems.

### Lessons from the credit crisis?

We have noted that the global financial crisis witnessed over the past 18 months has been extreme according to any historical benchmark. But what concrete lessons can be drawn from the experience of managing the credit events of recent quarters? Diana Chan reports that EuroCCP

## Providing valuation of assets under stress conditions

When we experience a period of discontinuous price movements such as those of the past 6-12 months, levels of correlation between factor inputs will often be substantially higher than predicted by historical pricing series. Ron Tannenbaum, Co-Founder, GlobeOp Financial Services, observes that when liquidity leaves the system, correlations between factors tend to rise sharply, offsetting much if not all of the diversification on which portfolio construction was predicated. It is then important to run scenarios that take these liquidity disruptions into account when forecasting price movements in highly irregular market conditions. By modelling the market under stress conditions, the manager and investor gain crucial insights into the susceptibility of the portfolio to sudden unexpected adverse price movements. Such analysis is more important than ever to investors intent not only on returns but capital preservation as well.

GlobeOp provides valuation for more than 65 distinct OTC derivative products traded by leading asset management customers. These instruments are all priced using GlobeOp's 65+ valuation models according to inputs that can be derived from liquid markets. GlobeOp will cross reference (or tolerance check) the results of their model driven valuations against a range of alternative pricing sources, including the asset manager's price, counterparty pricing, and mark-to-market pricing from independent pricing specialists when this is available for the instrument concerned. The consistent procedures GlobeOp will use to execute tolerance checks and deal

with exceptions for individual funds and specific asset classes will be prescribed by each fund's prospectus.

"With these tolerance checks in place, we raise a flag if we identify discrepancies that fall outside the tolerance limits between the manager's pricing and that drawn from other reference points," says Tannenbaum. "GlobeOp will start to ask questions – and we will do so at an early stage, ensuring that we resolve any possible anomalies well in advance of critical month end pricing days for example. Our task as a fund administrator is stringently to follow the pricing routines that have been agreed between the fund and its investors. In doing so, we aim to price every instrument on a daily basis, providing full position and cash reconciliation and a full daily P&L report."

To support this process, GlobeOp maintains a Fair Market Value Committee (FMVC) whose specialists are responsible for verifying the consistent application of valuation policies that fund managers have agreed with their investors – and for following up on any exceptions to the established procedure which may be identified. The company encourages buy-side firms also to maintain their own FMVC in order to review and verify internal procedures (see *FSR*, Q3 2008, p 71). In cases where a fund manager plans to invest in a relatively illiquid asset class, GlobeOp's FMVC will typically work with the fund manager, and potentially also the external auditor, to resolve the pricing complexities that this investment strategy may present.

offers a highly robust risk management model, backed by a parent company that has more than 30 years' experience in this area and which has successfully closed out more than 30 bankruptcies. This experience proved to be invaluable during the turbulent events of Q3 2008, during which Lehman Brothers passed into administration, generating more than US\$500 billion of market exposure. "As a CCP, it was important to minimise our exposure while closing out the Lehman portfolio; and also to minimise disruption to the market as we did so," says Chan. As central counterparty serving as buyer to every seller and seller to every buyer, all securities that EuroCCP receives as clearing agent will be in transit to another counterparty in order to finalise trade settlement. "We took care after Lehman passed into administration to support the flow of its securities through the CCP for as long as possible, thereby reducing the overall number of positions that would need to be closed out after the portfolio had been liquidated and ensuring at the same time that waiting participants received their securities without delay," she explains.

Indeed, prior to the markets opening on Monday 15 September, Lehman Brothers notified each of the relevant stock exchanges and MTFs that it would not trade that day. As a central counterparty, EuroCCP recognised that it would not receive newly-executed trades, but it would continue to receive stock from Lehman's settlement agents who would continue delivery in exchange for cash. "We continued to take in this stock as it arrived and to pass this through to the relevant counterparty for settlement, thereby reducing the number of positions that would ultimately need to be closed out and enabling the recipients to onward deliver to their clients, thereby helping preserve liquidity in the market," says Chan. When this flow of securities dried up, EuroCCP then declared Lehman Brothers to be in default and it liquidated the remaining portfolio. Having found a broker that could settle on T+1, this full process was finalised on Thursday 18 September. "In short, this difference reflects the depth of experience that EuroCCP, and its DTCC parent, has in liquidating a portfolio for a company in default," states Chan. "In rehearsing for such situations, we maintain regular fire drills and event simulations – and, through these test exercises, we are regularly fine tuning our risk management procedures to handle these default situations efficiently."

Euroclear attaches great importance to stress testing, not simply in terms of modelling extreme

market movements but also in rehearsing crisis management procedures in preparation for any possible shock event. John Trundle recounts that, in July 2008, its internal teams rehearsed a hypothetical situation that modelled the failure of one of Euroclear's largest clients. "This provided an opportunity to monitor the risks that we might encounter and the procedures that we would need to follow in order to manage our way through this scenario," says Trundle. "In fact, the client we selected was substantially larger than Lehman Brothers – and when the Lehman bankruptcy did arise, our staff were well prepared to manage the fall out, having negotiated an extreme default scenario several weeks previously." Given that a crisis situation is typically fast moving, it is important to have slick communication mechanisms in place such that staff know their responsibilities, where to locate key information, and how to use and report such information in a succinct way to all relevant parties.

In reflecting on lessons from the market turmoil, Trundle reports that Euroclear Bank has never made a credit loss in its history and it has preserved this record throughout the credit crisis. "Although Lehman Brothers was a sizeable client of Euroclear Bank, we were able to cover our credit exposure to Lehman by selling collateral that had been taken to protect against such an eventuality," he says. Credit extended by Euroclear Bank to its customers is short term, usually intraday, and advanced explicitly for the purpose of facilitating settlement. "In cases where we assist a customer to pay for or deliver securities intra-day to meet their settlement obligations, we extend this credit only against high-quality collateral with a cautious haircut – and we have spent much time in developing our collateral models to ensure that we are well covered for these short-term exposures," he adds.

FSR asked Carne Group's Chris Day whether, in light of the crisis, we see buy-side customers under pressure to tighten contractual terms and documentation governing rehypothecation of securities advanced as collateral. Indeed, when Lehman sank, a sizeable number of counterparties seemed to be lacking tight documentation. "Absolutely," he replies. "Asset managers should be fully aware of the contractual terms and operational practices applicable to their assets." Prior to the Lehman event, this may not have been at the forefront of discussions with providers, particularly if the relationship originated sometime in the past. Following Lehman, this is now one of the first discussion points managers raise with prospective providers.



**Roland van der Baan,**  
Head of Risk Management, KAS  
BANK

In recent months managers have looked to diversify risk and amend rehypothecation levels with multiple relationships, ensuring that, where possible, they are not indebted to their providers. In this way, they can reduce the amount of rehypothecation on their assets held in prime broker accounts.

More broadly, since last summer the prime brokerage landscape has been substantially redrawn and buy-side firms have been forced to review how they access leverage and a range of other service functions that many previously sourced en bloc from their prime broker(s). "Asset managers are waiting for the prime brokers to determine the scope of product and service they expect to offer," comments Day. "There was already a trend towards variable offerings whereby the manager (or investor) could pick the type of service required." Non-rehypothecated custody-type prime broker

its securities lending relationships and the collateral management procedures sitting around this product area. This has centred on strict credit evaluation of counterparties – and in steps to increase haircuts, to perform transactions exclusively on a prepaid basis, and to implement tighter criteria on the quality of non-cash collateral that the bank is prepared to accept (for example, excluding certain securities such as financials, imposing tighter requirements on liquidity and diversification of the collateral). KAS BANK does not accept cash collateral in its securities lending programme and does not offer a cash reinvestment programme to beneficial owners lending securities via this scheme, notes Roland van der Baan. "Moreover, all of our participants in the securities lending programme have, when requested, received all their lent securities back from us without delay." In this area, he predicts that the more widespread use of a central

The extension of DvP and real-time gross settlement models has reduced credit risks attached to payment and settlement operations, but this development has accentuated demand for intra-day liquidity. Central banks have extended intra-day credit facilities to cover these obligations, typically taking high quality collateral against the funding that they extend to the counterparty. As a consequence, customers require efficient procedures for managing these funding arrangements, including collateral movements across multiple markets and businesses .

accounts result in a higher cost, as the assets cannot be used to finance. Accounts which allow the prime broker to rehypothecate may therefore be cheaper due to the prime broker's ability to finance. "Custodians associated with prime broker facilities are now expected to offer the service of custody and prime broker management, so that assets can be allocated to the prime broker account to support any leverage required, leaving the majority of assets in the custody account," adds Day. "I would expect this type of active management to require greater operational control and management on the part of the custodian." Managers will also need to consider how increased pricing may impact their pursuit of certain strategies. Certain derivative products allow managers to source leverage, which together with a custody account may provide the leverage profile the manager requires without a traditional prime broker account.

Inevitably, in the face of the recent market turmoil, KAS BANK has been paying careful attention to

counterparty (such as the central clearing arrangements that SecFinex has recently announced with EuroCCP and SIS x-clear) may be important in limiting the risks of delivery without corresponding payment in securities lending transactions.

More broadly, KAS BANK has remained focused on limiting its business development to asset servicing activities for institutional investors and financial intermediaries (ie banks and brokers). The bank has no proprietary trading activities and does not offer asset management, including any form of money market or structured liquidity products. This prudent approach, suggests van der Baan, has proven beneficial in this volatile economic climate. The bank has continued to attract new business, particularly in the institutional segment (pension and insurance funds, charities) through demand for independent risk evaluation and for lifecycle savings products offered by the bank in partnership with third-party specialists such as PGGM and Loyalis.

## Risk management and competitive instincts

Reflecting on the origins and evolution of the crisis, it is apparent that at an academic level the industry still does not fully understand the mechanisms that enabled the credit bubble to expand to such major proportions. Looking back 3-4 years, central bankers were focused on monitoring a series of risks that posed threats to financial stability – but the general view was that these risks were well mitigated by a banking system that was strongly capitalised. With hindsight, it appears now that the industry was not capitalised sufficiently well to manage the series of shock events of the magnitude that we have witnessed during the past six

Though the direction is unclear at this stage, KAS BANK's van der Baan believes it probable that we will see revisions to the Basel Capital Accord in the aftermath of the global financial crisis. The Basic Approach under Basel II is a rigid framework that requires firms to hold a specified ratio of total capital and tier 1 capital to risk-weighted assets which does not move in line with market volatility. Recent market turmoil has illustrated a need to revise capital adequacy assessment regimes to make them reflect more accurately the risks that firms actually face in their business activities.

In response, it is possible that financial supervisors may make it mandatory for firms across the

At the end of 2008, Union Bancaire Privée (UBP) issued a letter to its customers in which it outlined that it would no longer invest in any hedge fund that did not employ an independent fund administrator. For UBP to retain full confidence in their investment managers, they are insisting on a full separation of powers between the manager, the custodian (or prime broker), the broker/dealer and the fund administrator.

months. Moreover, it is clear that the degree of correlation between different risk factors was in many cases much higher than previously anticipated.

In response, it seems probable that the banking industry will be under pressure to increase levels of capital that they hold against market, credit and operational risk. However, Euroclear's Trundle warns that we should be cautious at this stage about assuming that we have a deep understanding of the factors that prompted the crisis, how these are correlated, and what the solutions are. This will demand further analysis on the basis of quantitative and qualitative data available from this period.

Moreover, we must avoid jumping to premature conclusions about the value of risk metrics used to monitor financial risk. "Some commentators have been quick to criticise Value-at-Risk (VAR) measures as a primary indicator of risk," says Trundle. "However, at Euroclear we believe that VaR measures do retain value, as part of a broader suite of risk indicators, in helping firms to maintain consistent thinking around the risks that they face and how these risk profiles may evolve over time. The key point is that VAR is insufficient on its own and it is important to consider how extreme the 'tail events' might be and how best to mitigate those risks."

industry to employ an advanced methodology to assess their regulatory and economic capital requirements under Basel II. The Internal Capital Adequacy Assessment Process (ICAAP) is conducted internally by an institution and steps beyond Pillar 1 minimum capital requirements to deliver a more comprehensive assessment of senior management oversight, risk monitoring and reporting, and internal control reviews. The Supervisory Review and Evaluation Process (SREP) is conducted by the firm's regulatory authority and provides external validation of the firm's capital requirement under Basel II and the validity of its ICAAP. Though the ICAAP will increase the resources that small institutions must dedicate to risk evaluation and reporting, for those firms that have a sound methodology in place this is likely to generate risk assessments which fit much more effectively with the risk profile of the organisation.

In practical terms, Euroclear's John Trundle anticipates that at an organisation level these developments are unlikely to have dramatic impact on Euroclear Bank's capital requirements. Euroclear Bank retains an AA+ credit rating with S&P and Fitch Ratings. The business model that the bank employs – extending credit only for settlement purposes and with no agency or proprietary trading activities – is likely to present fewer concerns to

financial regulators in terms of its capital coverage. At the end of 2007, for example, Euroclear Bank's Tier 1 capital ratio was 63 per cent, well above the 8 per cent ratio prescribed by the Basel I capital framework. "Nonetheless, we are disciplined in modelling these risks in compliance with the new Basel Capital Adequacy requirements, monitoring the impact that market movements might have upon our earnings streams and ensuring that effective provisions are in place to mitigate all risks, including operational risks," he says.

For a central counterparty, Diana Chan believes that the most important risk management tools remain the need to establish strict participation criteria for its membership, and the need to collect sufficient margin to cover the CCP against losses it might incur in closing out a defaulted participant's positions. Thus, the ability to set an appropriate level of margin as part of its risk management is a core competence of the CCP. However, since MiFID,

### Redrawing supervisory objectives

As we strive to stabilise financial markets and institutions worldwide, Fed Chairman Ben Bernanke has made it clear that policy makers and senior industry figures owe to the public near-term, concrete actions to limit the probability and severity of future crises. Ongoing work must continue to strengthen the financial infrastructure – for example, by encouraging the migration of trading in credit default swaps and other derivatives to central counterparties and exchanges (see pp 16-19 and pp 46-49 in this issue ). The supervisory authorities must improve their capacity for surveillance of the financial system as a whole, rather than focusing excessively on the condition of individual firms in isolation. Moreover, it is necessary to revisit capital regulations, accounting rules, and other aspects of the regulatory regime to ensure that these do not induce excessive pro-cyclicality in the financial system and the economy. As we proceed with regulatory

Asset managers should be fully aware of the contractual terms and operational practices applicable to their assets... Following Lehman, this is now one of the first discussion points managers raise with prospective providers. In recent months managers have looked to diversify risk and amend rehypothecation levels with multiple relationships, ensuring that, where possible, they are not indebted to their providers. In this way, they can reduce the amount of rehypothecation on their assets held in prime broker accounts.

Chan observes a potentially worrying trend developing in the cash equities market whereby trading parties may direct their trades to a platform using a clearing house that charges the lowest level of margin. "Over time, competition in clearing could result in a convergence of margin levels towards the lowest available in the market," she says. "Publicly, clearing houses will maintain that they do not compete on risk management. In practice, we see competition between central clearers developing in exactly this area because the users are behaving in an economically rational manner, each for themselves. Regulators will need to monitor this trend carefully in order to ensure that CCPs maintain appropriate risk management standards and that they can meet their obligations to their clearing members. It would be a disaster for the industry if a CCP was to fail in circumstances where, in a bid to gain competitive advantage, it had failed to collect sufficient margin to cover its risk exposure."

reform, however, we must take care not to jump into responses that forfeit the economic benefits of financial innovation and market discipline.

This point is also embraced by Jacques de Larosière, Chairman of the High-level Group on Financial Supervision in the European Union. He emphasises that the supervisory objective of maintaining financial stability must allow the financial industry to perform its allocative economic function with greatest possible efficiency, thereby contributing to sustainable economic growth.

In line with Bernanke's sentiments, the de Larosière Group concludes that existing EU supervisory arrangements place too much emphasis on supervision of individual firms and too little on macro-prudential issues – a trend that is accentuated because it is duplicated in so many jurisdictions across the world. To be effective, macro-prudential supervision must encompass all sectors of finance,

including the wider macro-economic context, and should not be confined to banks. Effective macro-prudential supervision requires decision-making at EU level, in parallel with judgements made by individual member states – and the Group recommends that the European Central Bank (working alongside the Eurosystem more broadly) should be accorded responsibility for this supervisory oversight in the EU. When macro-prudential risks were identified prior to the crisis reaching its peak (and de Larosière points out that there was no shortage of warnings about macroeconomic imbalances and the declining price of risk) there was no effective mechanism to ensure that this assessment of risk was translated into appropriate policy action.

But amid the downbeat sentiment that has accompanied recent financial turmoil, it is perhaps easy to undervalue the relevance of interventions

many assumed that downside risks would be well contained by strong levels of capital coverage, diligent financial oversight and increasingly innovative risk management strategies within the financial services industry. With hindsight, it is evident that the levels of risks associated with these investment strategies were substantially underestimated. The challenge now is to refine our financial models to embrace the lessons that we have learnt over the past 18 months – integrating lessons gathered during the credit crisis in order to enhance our ability to model tail events, and to develop appropriate risk mitigating procedures in the future.

As Fed Chairman Bernanke points out, one area for urgent attention is to address the problem of financial institutions that are deemed ‘too big to fail’. A number of the large firms that governments were compelled to rescue in order to preserve

When we experience a period of discontinuous price movements such as those of the past 6-12 months, levels of correlation between factor inputs will often be substantially higher than predicted by historical pricing series. It is then important to run scenarios that take these liquidity disruptions into account when forecasting price movements in highly irregular market conditions. By modelling the market under stress conditions, the manager and investor gain crucial insights into the susceptibility of the portfolio to sudden unexpected adverse price movements. Such analysis is more important than ever to investors intent not only on returns but capital preservation as well.

from policy makers and central banks designed to contain instability in financial markets and to limit its negative impact on the real economy. Euroclear’s John Trundle notes that bank recapitalisation programmes have been introduced in a number of countries to preserve banking stability and to restore confidence in the sector. Some central banks have injected sizeable amounts of liquidity in efforts to reignite inter-bank lending and to limit contamination from one financial institution to another. Also, monetary policy adjustments have been employed to limit disruption to the real economy and to counter the descent of national economies into recession.

These interventions confirm that policy makers in leading global economies have been prepared to work closely together in order to identify the sources of financial instability and to develop common solutions. When the industry was growing rapidly, against a backdrop of relatively low interest rates and an aggressive search for yield,

financial stability were among the most avid risk-takers during the boom period. In the future, financial companies can expect close supervision of their risk-taking in instances where their failure will pose a systemic risk. Similar observations have been advanced this week by FSA Chief Executive Hector Sants, who has reinforced the likelihood of a move away from principles-based regulation towards a more intrusive regulatory effort to review the decisions of senior managers. A principles-based approach to supervision is unlikely to work with participants who have no principles, observed Sants. “We will seek to make judgements on the judgements of senior management and take actions if, in our view, those actions will present risks to [the FSA’s] statutory objectives”. Still smarting from the criticism that it has received for its perceived failure to pre-empt and control financial excesses pre-Lehman, we can anticipate a more interventionist, perhaps confrontational approach, from the regulator in times ahead. ■