Central Counterparty Default Management and the Collapse of Lehman Brothers

The collapse of US investment bank Lehman Brothers in late 2008 precipitated a one-day fall of around five per cent in major equity market indices, and falls of around ten per cent in major banking stocks as well as volatility in yields and credit spreads. During this time central counterparties around the world assumed Lehman Brothers' market positions as the bank defaulted on its obligations. Despite the massive market turmoil, central counterparties unwound, hedged, liquidated, and transferred millions of positions and client accounts worth trillions of dollars largely without loss, providing increased stability and certainty to already fragile markets. This paper – produced by CCP12, the Global Association of Central Counterparties[1] – summarises the major actions of a number of central counterparties, and in doing so highlights in a practical way the efficiency and strong value proposition of central counterparties in the current global financial environment.

Executive Summary

The collapse of Lehman Brothers represents one of the largest bankruptcies in financial markets history. The rapid but flexible response by central counterparty clearing houses (CCPs) provided stability and certainty to Lehman Brothers' counterparties and to markets in general. This flexibility allowed central counterparties to suspend or limit market access of defaulting Lehman Brothers entities within hours of the default announcement where relevant, while enabling solvent Lehman Brothers entities to continue trading, reducing market disruption and uncertainty.

For underlying clients of Lehman Brothers, actions by CCPs to either transfer or liquidate positions, often under the direction of the client, meant reduced uncertainty and risk, and prevented potential lengthy delays that might have occurred as a result of the liquidation process.

The comprehensive responses by CCPs enabled the vast majority of Lehman Brothers' proprietary and client positions to be settled as expected, with no substantial losses to central counterparties. These actions provided certainty to trading counterparties and Lehman Brothers clients at a time of unusual market stress, and highlight the practical benefits of the central counterparty clearing model.

Background

CCPs act as intermediaries in exchange-traded and over-the-counter (OTC) securities and derivatives markets. A CCP interposes itself on transactions, becoming a buyer to every seller, and a seller to every buyer. In doing so, the CCP takes on the counterparty risk associated with each clearing participant, and guarantees performance of the contract should one party fail to deliver on its commitment.[2] To support this guarantee, the CCP has a range of financial resources drawn from clearing participants (such as margins and clearing fund contributions), its own resources (such as equity capital and retained earnings), and third parties (such as insurance).

[1] Further information on CCP12 is provided at the end of this paper.

[2] In most cases, CCPs act as central counterparty on a principal-to-principal basis, meaning that the buyers and sellers are participants (or members) of the clearinghouse, rather than their underlying clients. In addition, CCPs often allow third party clearing arrangements, whereby one clearing participant will take on non-clearing trading firms as clients. In the event of a client default, in the first instance a third party clearing participant is generally responsible for any obligations of the defaulting entity.

CCPs offer a number of substantial benefits to markets, including:

- the ability to mitigate counterparty credit risk and increase market confidence by reducing systemic risk and uncertainty arising from a default event;
- increasing capital and balance sheet efficiency, reducing settlement obligations and systemic and liquidity risks by facilitating multilateral netting of settlements and exposures; and
- enhancing the efficiency of financial markets generally, by cutting the average costs of trading and increasing the profitability of their users and the effective capacity, volume, liquidity and product innovation of the marketplace.[3]

On 15 September 2008 at 12:30am New York time, Lehman Brothers Holdings Incorporated, one of the four largest US investment banks, announced that later that morning the company would apply for Chapter 11 bankruptcy. Lehman Brothers traded either directly or via subsidiaries in equities, fixed interest securities and derivatives across almost all developed markets.[4] However, direct participation at the clearing house level varied: in some markets Lehman Brothers operated as a direct/general clearing participant on behalf of itself and its clients, while in others it used third party clearing arrangements.[5]

The uncertainty created around the bankruptcy of Lehman Brothers Holdings Incorporated in the US raised concerns about the solvency of other Lehman Brothers subsidiaries, and their ability to deliver on obligations to CCPs and third party clearing guarantors around the world. This paper examines how CCPs responded.

Central Counterparties Respond to the Bankruptcy Announcement

The bankruptcy announcement of Lehman Brothers Holdings Incorporated in the US, and the implication for its international subsidiaries, saw a rapid response from CCPs (Figure 1). Many CCPs, including CDS (Canada), ACH/SFECC (Australia), NOS Clearing (Norway), CCV (Mexico), and CSDCC (China) did not have Lehman Brothers as a direct clearing participant, and therefore, had no direct financial exposure to the default.

While these CCPs experienced no direct exposure, the risk that third party clearers responsible for settlement would also fail remained a distinct possibility, and many of these CCPs worked closely with affected clearing participants to resolve outstanding positions.

Third party clearers and trading venues acted quickly to suspend Lehman Brothers and prevent any further risk or positions accumulating. The Australian Securities Exchange (ASX), the operator of the Australian equity and derivatives exchanges, was open at the time of the bankruptcy announcement and suspended Lehman Brothers from trading on both its markets following the termination of Lehman Brothers' third party clearing arrangements. Similarly, CC&G (Italy), while not having a direct relationship, coordinated with Lehman Brothers' third party clearing agent to implement its default management procedures on 16 September.

Where Lehman Brothers participated directly in the clearing process, most international CCPs confirmed suspension, declared Lehman Brothers in default, or implemented restricted trading arrangements before markets opened following the US announcement. However, a number of

[3] More detail on central counterparties, and the value they provide to marketplaces, can be found in the CCP12 document, *The Value Proposition of Central Counterparties,* published in March 2009.

[4] Further details about Lehman Brothers' business can be found at the PwC liquidator's website http://www.pwc.co.uk/eng/issues/lehman_updates.html.

[5] Note, for simplicity, exact legal names of each entity in each country have not been used. The term "Lehman Brothers" is used as a generic name for all Lehman Brothers entities.

exchanges continued to allow trading and settlement by subsidiaries provided they continued to meet CCP obligations. For example, Lehman Brothers subsidiaries in India were able to settle their obligations to CCIL on 15 and 16 September as required, and CCIL later worked with regulators to facilitate the close-out of Lehman Brothers' outstanding positions in interest rate swaps by providing the regulator with the relevant information to enable early termination of the contracts by 19 September.

LCH.Clearnet Ltd, which clears the London and SWX Europe stock exchanges, the Euronext.Liffe derivatives market, the London Metal Exchange and (at the time) ICE Europe, as well as OTC commodities, European fixed income and the global interest rate swap markets, declared the two Lehman Brothers entities for which it cleared defaulters at 9:30am GMT on 15 September. LCH.Clearnet SA, which clears NYSE.Euronext, Liffe European continental derivatives, French and Italian bonds and repos, as well as Powernext energy spot and derivatives markets, declared Lehman Brothers in default around the same time.

Eurex Clearing, which clears for the Eurex derivatives exchange and the Frankfurt stock exchange as well as the Irish stock exchange (which was not directly affected by Lehman Brothers), and EuroCCP, which clears for the multilateral trading platform Turquoise, similarly announced suspensions on the same morning.

Most major Asian markets, including Japan, South Korea, Hong Kong and China, were closed on 15 September due to a public holiday. However, the Singapore stock exchange (SGX), which was open, confirmed on 15 September that Lehman Brothers was meeting its commitments to SGX's clearing houses, but the following day Lehman Brothers

Figure 1 Timeline of CCP Major Decisions/Actions

Default Time	
T=0	**Lehman Brothers (LB) US Announces Bankruptcy**
+24 Hrs	**CCP Confirms No Clearing Relationship with LB:** ACH, SFECC CSDCC NOS Clearing ASA CDS CCV **CCP Confirms LB Continues to Meet Obligations:** ICE Clear DTCC (NSCC, GSD, MBSD) SGX CME **CCP Announces Default or Suspension of LB:** LCH.Clearnet Ltd., LCH.Clearnet SA Eurex EuroCCP European Commodity Clearing SIX x-clear HKSCC, SEOCH **CCP Announces Restricted Trading/Clearing for LB:** HKCC **General Announcements/Actions:** Japan, South Korea, Hong Kong and China markets closed on 15 September due to public holiday.
+48 Hrs	**CCP Announces Default or Suspension of LB:** JSCC SGX HKCC KRX **CCP Announces Willing/Commenced Transfer of Client Accounts:** LCH.Clearnet Ltd., LCH.Clearnet SA JSCC SGX **General Announcements/Actions:** EuroCCP brings forward equities settlement to T+1, completing close-out of LB positions. European Commodity Clearing successfully closes all LB house positions without loss. HKSCC completed close-out of LB's positions. RBI restricts LB trading in government securities (India).
+ 5 trading days (19/9/08)	**General Announcements/Actions:** SGX announces LB house positions closed without loss. Approval for Barclay's purchase of US business, and transfer of hundreds of thousands of client accounts. Neuberger Berman announces transfer of 60 000 client accounts to Ridge Clearing & Outsourcing Solutions. LB suspended from CME. SIPC liquidator appointed to LB subsidiaries in the US. DTCC CCPs begin close-out of house LB positions. HKCC completes closes-out of LB positions without loss. LCH.Clearnet announces 90% reduction in risk of inherited Lehman Brothers positions. LCH.Clearnet Ltd and SA largely complete transfer of all client positions and close-out of house account.
+ 10 trading days (26/9/08)	**General Announcements/Actions:** Eurex completes transfer of client accounts. SIX X-clear announces successful close-out of LB positions without loss. KRX completes close-out of equities positions.
+ 15 trading days (3/10/08)	**General Announcements/Actions:** DTCC CCPs successfully closes-out all LB house positions without loss. Eurex announces successful close-out of LB house positions without loss.

was suspended from trading, and was prevented from opening any further business.

When the Hong Kong markets re-opened on 16 September the Securities and Futures Commission (SFC) of Hong Kong issued restriction notices on the local regulated Lehman Brothers securities, futures and options operations. The restriction notice applicable to Lehman Brothers Securities Asia Ltd (LBSA) effectively prohibited LBSA from settling any of its positions in HKSCC's Central Clearing and Settlement System (CCASS). Following the restriction notice, LBSA was declared a defaulter by HKSCC. LBSA also traded equity options as a direct clearing participant of the SEHK Options Clearing House (SEOCH); however, the nature of the equity options portfolio did not represent any risk exposure to SEOCH. A second entity, Lehman Brothers Futures Asia Ltd (LBFA), cleared futures and index options as a participant of HKFE Clearing Corporation (HKCC). The SFC restriction notice applicable to LBFA provided for LBFA to close-out its positions pursuant to client instructions being confirmed and as long as it continued to meet HKCC's rules. The close-out provision was applicable to LBFA initially for one day, and subsequently extended by the SFC for a second day, at which point LBFA failed to meet an intraday call by HKCC and was defaulted under HKCC rules.

Both JSCC, the CCP for the Tokyo Stock Exchange, and KRX (South Korea), upon re-opening after the public holiday, suspended any settlements with Lehman Brothers from 16 September.

The bankruptcy announcement in the US explicitly identified Lehman Brothers entities that remained solvent, reducing confusion and providing greater clarity than was available in other international markets. As a result, US CCPs were able to continue clearing relationships with Lehman Brothers' non-bankrupt subsidiaries. DTCC's central counterparties, NSCC and FICC (through its divisions GSD and MBSD), both confirmed on 15 September that Lehman Brothers subsidiaries remained solvent participants of the central counterparty, and that other clearing members would continue to be covered by the guarantee of the CCP.[6] ICE Clear US announced that its Lehman Brothers clearing member continued to meet its obligations, and that outstanding exposures to Lehman Brothers were immaterial. Similarly, CME announced on 15 September that Lehman Brothers continued to meet commitments to the clearing house, before ultimately being suspended on 19 September.

Default Management and Risk Reduction

Central counterparties take on obligations - and therefore associated risk - from their clearing participants. CCPs quantify and mitigate these risks through a number of risk reduction strategies. These strategies may include limiting access to the clearing system to financially robust institutions, calling margins and other financial contributions from clearing participants, and holding capital and insurance for use against events of default. These measures act to cushion both the CCP and the wider financial system from the potentially systemic impact of default events.

Despite differing CCP relationships held and business undertaken by Lehman Brothers, the approach by CCPs to reduce their exposure to Lehman Brothers was, in broad terms, similar, with some exceptions influenced by regulatory restrictions. Notwithstanding this, adequate flexibility existed within CCPs' default management plans and/or existing rule powers to account for individual market conditions and thereby minimise the extent of financial loss and maintain stability within the various markets.

[6] National Securities Clearing Corporation (NSCC) clears equity, listed corporate and municipal bonds, and unit investment trust trades. The Fixed Income Clearing Corporation (FICC) has two divisions that clear trades in US Government debt issues and repurchase agreements (GSD), and the mortgage-backed securities market (MBSD).

Client Accounts
In many markets, Lehman Brothers operated an extensive broking business, and in doing so, undertook transactions on behalf of retail or wholesale clients. Lehman Brothers interposed itself between thousands of underlying clients and the market, transferring payments or securities made by its clients to other counterparties, and receiving payments or securities on behalf of its own clients.

Irrespective of the solvency of the underlying clients or account, the collapse of a broker typically results in restrictions on client access to their accounts and positions. This action (usually taken by the administrator or by the broker itself) prevents further trading until clarity around obligations is achieved, but also prevents clients from managing their risks, liabilities, and profits.

In response, and in coordination with local supervisors and insolvency officers, CCPs acted quickly to transfer (or facilitated transfer under the direction of the client) solvent client accounts to other non-defaulting clearing participants, and in doing so, enabled access for clients to manage their accounts and risk within a short time frame.

The JSCC, LCH.Clearnet Group and Eurex Clearing all sought direction from clients on the future of their accounts. JSCC allowed derivative clients up until 24 September to nominate their accounts for either close-out or transfer to a willing clearing participant. After this time accounts were closed out automatically. Similarly, LCH.Clearnet Ltd announced on 16 September that it was willing to transfer client accounts (in their entirety), and announced this had largely been completed by 19 September. Eurex Clearing AG announced that all positions were transferred under the direction of the relevant clients by 22 September. SGX announced that it was facilitating transfer of client derivative positions at the same time as the trading suspension on 16 September.

In the US, Barclays Capital announced plans to purchase almost the entire Lehman Brothers business on 17 September, including several hundred thousand client accounts.[7] Similarly, Neuberger Berman, a non-defaulting Lehman Brothers subsidiary, was able to fully transfer its clearing arrangements for its client base (some 60,000 accounts) to Ridge Clearing & Outsourcing Solutions.

The response by CCPs enabled the vast majority of Lehman Brothers clients to continue to manage their accounts and risk within weeks, and in some cases within days, of the collapse.

House (Proprietary) Positions
Lehman Brothers' house positions represented proprietary trading on behalf of the entity itself. As such, third party interest in such transactions was limited, resulting in most CCPs closing out Lehman Brothers' house positions.

European and Asia-Pacific CCPs began default procedures following announcements on 15 and 16 September. Eurex Clearing and SGX closed out and liquidated inherited house equity and derivatives positions, with Eurex Clearing announcing completion of its default management of the event with no further liabilities on 30 September, and SGX announcing that the successful close-out of proprietary positions was completed on 19 September. EuroCCP completed its close-out of Lehman Brothers' proprietary positions on 18 September.

[7] http://www.sec.gov/news/press/2008/2008-215.htm

LCH.Clearnet announced on 19 September that any losses arising from the default management process would be within Lehman Brothers' margin held, and by 23 September LCH.Clearnet had achieved a reduction in risk of some 90 per cent, seven days after the default.

JSCC inherited a number of outstanding equity and derivative obligations as a result of the Lehman Brothers collapse. JSCC chose to obtain a line of credit and injected funds to settle outstanding buy equity obligations over 16-18 September, while simultaneously failing sell obligations until JSCC could obtain and settle these transactions over the T+3 settlement cycle. JSCC also funded derivative obligations, while undertaking offsetting transactions to liquidate any outstanding positions. JSCC announced that any losses on these transactions were covered by collateral posted by Lehman Brothers prior to its default.

As outlined above, LBSA was declared a defaulter by HKSCC on 16 September, with the CCP taking action to close LBSA's defaulted positions (totalling HK$3.5 billion), in accordance with its rules. The close-out required on-market purchases by HKSCC to complete settlement of all LBSA defaulted positions, and also involved the CCP arranging HK$2.5 billion in funding. The HKSCC suffered a loss of approximately HK$157 million on the closing out of these positions. In the case of SEOCH, all LBSA equity options positions were kept unchanged in accordance with the restriction notice, except those contracts which subsequently expired. Consequently, there was no loss incurred by SEOCH. With regard to futures and index options business, the restriction notices specific to LBFA prohibited it from entering into new transactions, but LBFA was granted two days to close-out its client positions in an orderly manner. During this two-day period, LBFA closed out and/or transferred part of its futures and index options portfolio, and continued to meet HKCC's margin demands. At 16:54 pm on 17 September, LBFA failed to meet a HKCC intra-day variation margin call, and was suspended by the exchange and HKCC. Remaining outstanding positions were closed out by HKCC on 18 September with no loss incurred.[8]

Following the appointment of the Securities Investor Protection Corporation (SIPC) trustee liquidator on 19 September in the US, DTCC began winding down Lehman Brothers' outstanding obligations.

DTCC announced on 30 October that its various CCP subsidiaries had successfully closed out any remaining positions as a result of the Lehman Brothers collapse. FICC, which clears mortgage-backed and government securities, netted and liquidated some US$329 billion in par value of outstanding forward trades in mortgage-backed securities, and a further US$190 billion in gross government bond positions. NSCC, which clears equities, municipal and corporate bonds, inherited a US$5.85 billion portfolio as a result of the collapse. NSCC was able to gain access to US$1.9 billion in pledged securities to settle outstanding equity obligations, and acted to liquidate or hedge other outstanding option exercise positions, ensuring settlement and market stability during this time.

EuroCCP, DTCC's European subsidiary that cleared trades for Lehman Brothers' UK subsidiary in 12 markets across Europe, suspended Lehman Brothers on 15 September and declared it in default the following day. The two-stepped approach was taken to minimise market disruption and reduce EuroCCP's exposure. As a result, €5 million of securities received from Lehman Brothers' agent banks were delivered to other clearing participants on

[8] http://www.hkgem.com/news/hkexnews/081112news.pdf

the settlement due date. The close-out of the remaining €16 million of obligations was executed with settlement on T+1, which accelerated by two days the delivery of securities to the waiting participants.

In testimony before the US House Committee on Agriculture on 8 December 2008, CME Group Chairman Terrence Duffy indicated that Lehman Brothers positions were liquidated or sold with no loss to the clearing house, and additionally, "no futures customer lost a penny or suffered any interruption to (their) ability to trade."[9]

Post Lehman Brothers – Default Management Review and the Future of CCPs

Notwithstanding the success of existing default procedures and resources during management of the Lehman Brothers default, CCPs continue to monitor and review risk management frameworks where relevant to ensure CCPs remain able to meet their commitments to the market. CCPs have been actively reviewing events and actions in order to improve upon and consolidate lessons learnt from both their own experience, and those of other CCPs, to enhance the risk control frameworks already in place.

The success of the central counterparty clearing house model during the financial turmoil in late 2008 has since spawned efforts by regulators and the industry to expand CCP clearing into OTC derivatives markets, including the credit default swap (CDS) market.[10] Since announcements were first made in late 2008, a number of entities have begun providing clearing and CCP novation services for OTC derivatives contracts in the US and Europe.

About CCP12

Formed in 2001, CCP12 is a global association of 23 major central counterparty organisations in Europe, Asia and the Americas. CCP12's mission is to share information, support development of standards and liaise with regulators, industry groups and global market users to foster dialogue on areas of mutual interest and concern, and to promote best practices in CCP risk management.

For further information about CCP12 activities or to enquire about joining CCP12, please contact the current Chair, Ms Anne Brown, Chief Risk Officer of the Australian Securities Exchange at 612 9227 0233 or via anne.brown@asx.com.au .

[9] http://www.cmegroup.com/company/files/TDTestimony_120808.pdf

[10] See announcements by the Federal Reserve Bank of New York at http://www.newyorkfed.org/newsevents/otc_derivative.html and by the European Commission at http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/08/538&format=HTML&aged=0&language=EN

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