FOREIGN EXCHANGE CONTACT GROUP
OPERATIONS MANAGERS GROUP

REPORT ON OPERATIONAL LESSONS FROM THE DEMISE OF LEHMAN BROTHERS IN AUTUMN 2008

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1. Introduction

The ECB Foreign Exchange Contact Group (FXCG) requested the ECB Operations Managers Group (OMG) to produce a paper on the operational lessons learned from the demise of a big player such as Lehman in the markets in Autumn 2008. In terms of scope, this paper is restricted to summarising the ideas and experiences made following the downfall of Lehman Brothers with particular reference to the operational aspects of the *FX market*. The paper touches upon some important *legal aspects* that emerged during the Lehman demise but it does not analyse the impact on other asset classes or on the broader financial world. The paper puts forward some *recommendation*s to ensure an adequate response of the operational areas of a bank including indications on what could be improved in case a similar event would occur again.

2. The events

In the weeks before the downfall of Lehman Brothers, several institutions were experiencing difficulties in their balance sheets because of sharp movements in market prices and were (forced to be) taken over by other institutions to prevent knock-on effects on other major financial institutions. Lehman Brothers also was among those institutions experiencing problems.

At that stage, the markets still expected that Lehman Brothers was considered to be *too big to fail* and anticipated a rescue plan or take-over. It came as a shock when it turned out that the assumption was wrong and Lehman Brothers Holdings Inc. announced that it filed for protection under Chapter 11 on 15 September 2008. It further announced that its many subsidiaries would continue to operate as normal, even though the exact implications of this announcement were unclear to other operators, as Lehman was a large and complex financial conglomerate that operated in over 40 countries through more than 650 legal entities outside the US. A group of Wall Street firms, with bankruptcy court protection, agreed to provide capital and financial assistance for the bank's orderly operation and liquidation and the Federal Reserve, in turn, agreed to a swap of lower-quality assets in exchange for loans and other assistance from the government.

Although the credit crisis had banks walking on their toes well before 15th September, the filing for Chapter 11 of Lehman Brothers was a dramatic event that pushed the banking world into the crisis situation as we have seen since.

The inter-bank lending market *dried up* immediately after the event and central banks and governments had to step in to provide liquidity and to guarantee deposits.

3. Consequences of the Lehman bankruptcy for banks

The immediate effect of the Lehman bankruptcy for banks was to *stop all outgoing payments* to all Lehman Brothers entities that had filed for Chapter 11 or similar kind of proceedings in their jurisdiction. The biggest challenges in that respect were to identify exactly which entities had filed for Chapter 11 or similar kind of proceedings in their jurisdiction, to identify the specific trading names connected to those legal entities, to internally identify all outgoing payments ready for release to those trading names and to stop the payments from being released. A global co-ordination exercise to execute the above across the globe had to be put in place immediately, resulting in “Crisis Teams” being set-up and executing the above in the weekend of the Lehman event.

Relevant *legal issues* emerged, that had to be taken into consideration. Determining “rights of set off” of, or against, different Lehman entities aggravated the situation. It is important to note that rights of set off tend to cross product lines, including FX product lines, making it necessary to consider trading relationships very broadly. Rights of set off have given rise to litigation over substantial amounts.

As is evident from the court proceedings following the Chapter 11 filing, there were also many transfers to Lehman entities that Lehman counterparts are trying to have classified as “misdirected transfers” in order for them to be returned to those counterparties. Many of the disputes about “misdirected” transfers involve issues of fact that will take significant time and resources to resolve, notwithstanding the New York bankruptcy judge’s stated intention to expedite hearings on those matters.

After the Lehman filing event, the *banking world became cautious* as trust had evaporated and banks became very careful with regard to their outgoing cash-flows. In order to control the outgoing cash-flows and to reduce settlement risk as much as possible, risk departments continuously re-assessed other financial institutions. Outgoing cash to financial institutions perceived to be in trouble was released as late as possible to reduce the time for which settlements were at risk.

Also as a result of the Lehman event, the *inter-bank lending market dried up* altogether as all banks took protective measures. Central banks had to step in to provide liquidity to the market. The FX swap instrument was left to square up the banks’ external balances, however also this instrument was used cautiously and was only entered into on a ‘safe settlement’ basis in special circumstances when there was a gross settlement and the settlement risk was deemed too high. FX swaps that would settle through CLS were granted authorisation far more easily than those that would settle outside the system.

The volume in the *FX market* grew considerably due to the increased volatility in exchange rates. Consequently, the automated processes within banks, but also within the settlement systems providers/infrastructure (e.g. CLS, SWIFT), were required to process unprecedented volumes. The market experienced delays in the confirmations and processing on some days, however not to an extent where it actually became a problem. The processing capacity of banks and settlement systems providers was tested successfully.

4. The Lehman bankruptcy and the impact on global FX settlement

Lehman Brothers Holdings Inc (Lehman) was a global financial services firm with its main business in investment banking, investment management and private banking. The company was not a commercial bank with a direct systemic impact on consumers and retail payment infrastructure, nor an agent bank offering correspondent banking services such as USD clearing to others. The direct settlement impact of the bankruptcy event and the associated credit and immediate settlement risk[1] therefore affected directly the inter-bank FX and derivatives markets.[2] A possible approach to assess the FX settlement is to distinguish between CLS settlement and non-CLS settlement. Each has its own risk associated with it, which will be subsequently addressed.

4.1 CLS Settlement

In the FX markets, settlement risk has been eliminated for the deals flowing through the CLS system. While Lehman Brothers was a founding member of CLS, it opted for a User Member[3] status, using Citigroup as Designated Settlement Member (DSM) to settle its FX transactions. There was uncertainty in the days immediately after the demise of Lehman on whether the DSM would authorize Lehman's trades by 22.00 CET.[4] Reportedly there was intense communication on a daily basis between the US Regulator and the banks involved in the process. At the end of the day settlements were made, and for the FX market this arrangement worked. Despite the markets being fundamentally interconnected, the failure of one large player did not cause severe disruption throughout the market.

The uncertainty as to whether Lehman would pay or not could have prompted recourse by other CLS users to rescind payments (i.e. suspending FX transactions with Lehman unilaterally). The non-settlement by Lehman or the rescind could have altered the projected CLS funding requirements for other settlement members. This uncertainty led some parties to demand that CLS extend payment deadlines, a request that was not implemented on grounds that this would have put additional pressure on CLS and Settlement Members, already strained by the very high volumes that were being settled at the height of the turmoil.

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1 Settlement risk is the risk that a counterparty does not deliver a security or its value in cash as per agreement when the security was traded after the other counterparty or counterparties have already delivered security or cash value as per the trade agreement.

2 The analysis of the impact of crisis events on settlement of securities (which are mainly carried out on a Delivery versus Payment basis – DvP) is beyond the scope of this paper. Specifically on securities settlement issues, the ECB COGEPS and COGESI Groups agreed on the usefulness of gaining more insights into problems that participants and providers of payment systems and securities clearing and settlement systems experienced during the recent financial turmoil and in particular the default of Lehman Brothers. Two questionnaires were circulated separately in late 2008 to be filled-in by providers of settlement services and to banks. The results have yet to be assessed.

3 A User Member is connected to a Settlement Member that settles the User Member's instructions through the Settlement Member's account with CLS Bank. Each instruction submitted by a User Member must be authorised by its Settlement Member, which has the responsibility of the funding.

4 Central European Time. 22.00 is the time by which Lehman's DSM would have to authorise Lehman's trades each day.

At the end of the day, CLS proved that it effectively offsets the problems it was designed for i.e. to prevent a systemic crash by removing principal risk (the so-called “Herstatt”-Risk).[5]

Nevertheless several points related to CLS surfaced during this event. In case an institution that takes part in the Inside/Outside (I/O) swap process foreseen in the CLS clearing procedures would be in a similar situation as Lehman Brothers, Herstatt risk would be re-introduced via these *I/O swaps*. During the crisis, banks became very aware of this and were more and more reluctant to take part in the I/O swap process. In some cases, I/O swap limits were reduced in order to reduce risk. If a situation where an I/O swap participant comes in a similar situation should occur again, the I/O swap process could be affected, which would have a significant effect on the effectiveness of the CLS pay-in/pay-out process.

Currently, CLS covers approximately 55% of the global FX market, with a focus on the major currency pairs. With about 3,300 third-party members, the settlement risk in the market is still not zero for all participants. There is still some 45% of FX settlement obligations settled in ways that generate significant potential risks across the global financial system. This 45% is made up of 3 parts:

1. Parties that do not settle through CLS
2. Currencies that are not eligible for CLS
3. Same-day FX transactions

The most relevant aspect during the crisis was represented by the parties that do not settle through CLS.

4.2 Non-CLS Settlement

FX settlement with parties that are not settling through CLS is performed in 3 possible ways:

- Gross settlement
- Over bilateral accounts
- Bilateral netting

Gross settlement describes the situation where both sides of an FX transaction are exchanged in full i.e. no settlement for the difference or netting against other cash flows is performed. These cash flow exchanges are made via nostro agents. Gross settlement risk comprises both credit and liquidity risks.

[5] According to the Bank of International Settlements’ Glossary, “Principal Risk is the credit risk that a party will lose the full value involved in a transaction. In the settlement process, this term is typically associated with exchange-for-value transactions when there is a lag between the final settlement of the various legs of a transaction (ie the absence of delivery versus payment). Principal risk that arises from the settlement of foreign exchange transactions is sometimes called *cross-currency settlement* risk or *Herstatt* risk” after the German bank whose failure made this risk well known. On 26th June 1974, the bank's license was withdrawn by German regulators at the end of the banking day (4:30pm local time) due to a lack of income and capital to cover liabilities that were due. But some US banks in foreign exchange transactions had already paid deutschemarks to the bank during the day, believing they would receive US dollars the next day in Germany or later the same day in the US. But after 4:30 pm in Germany and 10:30 am in New York, Herstatt Bank stopped all dollar payments to counterparties, leaving the counterparties unable to collect their payment. The closing of Drexel Burnham Lambert in 1990, Bank of Credit and Commerce International in 1991, and Barings in 1995 resulted in similar losses for counterparties in the foreign exchange market.

The former arises when a counterparty cannot meet an obligation for full value on due date and thereafter because it is insolvent. Liquidity risk refers to the risk that a counterparty will not settle for full value at due date but could do so at some unspecified time thereafter, forcing the party which did not receive its expected payment to finance the shortfall at short notice. Gross settlement was the settlement method that posed the most risks to banks especially after the Lehman event. As banks became very protective with regard to their outgoing cash-flows, safe settlement became widespread practice

Settlements over bilateral accounts are not affected where both sides of the FX settlements are settled over a bilateral account (e.g. vostro accounts, loro accounts or correspondent banking accounts) or where the receipt side is settled over a bilateral account. For those settlements where only one payment side settles over a bilateral account and the other side settles externally via a nostro agent, the same applies as for gross settlements. Where the receipt side is debited from the bilateral account and the counterparty does not offset the resulting debit balance on the account, this de facto results in an unwanted credit facility. The same applies where the payment side is transferred to the bilateral account and the receipt side is received at the nostro agent, giving the counterparty the opportunity to take out the credit balance of the bilateral account and not pay out via the nostro agent. The result is also de facto an unwanted credit facility.

Where *bilateral netting* agreements are in place, the settlement risk is reduced to the net balances rather than the total FX settlements. However, settlement risk – though over a smaller amount - is still there. These settlements were therefore monitored just as closely as the regular Gross Settlements.

4.3 Bank response from a non-CLS settlement view point

The first action typically taken by an *operations team* before start of business on Monday 16th September following the Lehman collapse was to suppress all payments due for release on the first working day. While operating systems are designed to achieve STP processing, flexibility to override the STP and manage the cash-flows was critical. A further difficulty encountered by operation teams was reconciling the entity names on the internal systems to the names cited on external communications; this issue arose regardless of the CLS status. As with the CLS settlement banks, the operations team sought clarity on which Lehman entities were still operating and which were in administration.

Contingency plans were in place for dealing with such events as a counterparty defaulting. These preparations meant all internal business areas including operations were well prepared with a high degree of coordination between the affected parts of the business (treasury/risk/credit, legal and operations).

Contingency preparations were extremely important, ensuring communications were clear and all activity was centrally managed. On an ongoing basis the internal Credit/Risk and Executive Teams provided direction on the settlements. As the *settlement activity* spanned several Lehman entities the operation team performed extra checks and controls on the accuracy of the confirmation matching, the Standard Settlement Instructions (SSIs) as well as monitoring ‘nostro’ accounts for the 'receipt side' of the FX transactions. As transactions were spot FX, the period of monitoring and managing payment release was short and intensive. The settlements in effect were 'payment after payment'.

5. General operational issues following filing for Chapter 11

The main task of Back Office Operations in case of market disruption due to events of default is to hold any *outgoing payments* to the defaulting counterparty, resulting from all types of transactions, from all systems and in all global time-zones, depending on the legal position vis-à-vis the defaulting counterparty. This is, depending on the size and complexity of the institution, a complex task that is made more difficult by the matrix of contractual and legal rights, including rights of set-off, that apply to transactions with a conglomerate, of which a part is in default.

The fact that CLS worked well (and that the derivatives market did too) reduced the payment risk to a bilateral issue between Lehman and the counterparty bank. Each institution will have had its share of issues but none led to the materialization of a Herstatt-like risk.

Another main issue banks were confronted with was to understand *the type of payment* they were dealing with, i.e. whether stemming from a clear bilateral FX transaction, or Lehman acting e.g. as a payment agent in case of syndicated loans. Questions included who was the legal owner of the funds, and therefore, what was the consequence of holding back payments.

This ties into the legal context of a bankruptcy filing involving a financial conglomerate as large and as complex as Lehman. Understanding which subsidiary, under which jurisdiction or ISDA version, acting on whose behalf proved to be complex, particularly when factoring rights of set off, and guarantees or collateral support agreements that involved the parent Lehman entity that had first filed for Chapter 11 protection. Withholding payments without justification in a very tense market where trust among participants has disappeared and small events might imply large consequences needed to be avoided at all costs.

Understanding the situation in such circumstances is a key element for action. More than ever it became apparent that clear and quick *communication* to the broad marketplace is of crucial importance. This communication should come from a central institution and/or the source of events and be dispersed effectively across the markets. A major role was played, but could be further strengthened, by Central Banks and Regulators, next to individual Central Counterparties (CCPs).

On a national and international level several Operations Managers Committees are active, of which this Operations Managers Group is one. Similar Committees are in place in for example the London, New York and Tokyo markets. Most Committees organized meetings by conference call after September 15th. The general experience made is similar: namely that these calls were not very effective. Banks tended to withhold information relating to settlement and to their perception of other banks' solidity, as this was deemed highly sensitive information and not fit for discussion in wide forums.

Further *operational risks* may arise from the future activities of the Lehman trustees who have not released counterparties on defaulted Lehman trades, and may therefore challenge claim calculations. Certain claims, including claims of Lehman, may also be pursued by the distressed debt funds that have attended various court hearings.

6. Lessons learned

The most important lesson learned from the Lehman downfall is that it is imperative for all operations teams to have *full control over all outgoing cash-flows* and to be able to take measures immediately. Banks have set-up processes and procedures to enable them to react immediately in any future events. These processes and procedures need to updated and tested continuously to maintain the ability to react effectively when needed.

The Lehman downfall also proved that *CLS is an effective measure* to mitigate settlement risk. Some settlement risk is re-introduced however via the I/O Swaps.

It also made apparent that there is still quite a big portion of *FX settlements that are outside CLS* and further efforts need to be put into expanding the portion of FX settlements settled through CLS.

A further lesson learned is that *information and communication* are key to ensuring a successful reaction in crisis situations. Such information and communication should come from a central institution and/or the source of events and be dispersed effectively across the markets. A major role was played, but could be further strengthened, by Central Banks and Regulators, next to individual CCPs.

7. Conclusions and recommendations

The operational consequences for the FX market of the Lehman downfall have been handled very well. The fact that Lehman Brothers settled their FX through CLS was crucial. It proved that CLS is effective in actually protecting the global financial system from significant settlement risk.

However, the Lehman downfall showed that there is room for further improvement for managing such crises.

In order for the FX market to improve its resilience in the face of future events similar to the Lehman downfall, the following *recommendations* can be put forward:

1. *Individual institutions*: Implement further settlement risk reduction measures through the adoption of payment vs. payment services such as CLS and promote their use; address the lessons learned; adopt or extend bilateral netting outside CLS;

2. *Industry groups*: extend services and encourage progress (CLS et al: attract more parties to use payment vs. payment settlement services like CLS; extend the CLS eligibility by extending its use with other currencies and include same-day FX settlements; continue developing FX settlement services, support the work of FX committees et al: encourage further progress);
3. *Central banks*: encourage progress and warn against banks backsliding over progress made in safer procedures; continue cooperative oversight; monitor developments;

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