A survey of the measurement and management of settlement risk

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1. Introduction

The risk that arises from the settlement of FX and other transactions has long been a concern of risk managers, supervisors and central banks. Settlement risk was first brought into focus following the failure of Cologne based Bank Herstatt in 1974. On the day of its failure a number of banks had entered into FX trades with Bank Herstatt converting Deutsche Marks into US Dollars. The Deutsche Marks were delivered but the banks never received their Dollars. The BIS has issued a number of analyses and guidance notes on settlement risk, most recently in February 2013\(^1\), and institutions have upgraded their measurement and management of settlement risk. Nevertheless, as this survey shows, there is still room for improvement particularly by smaller institutions.

We specifically consider the following areas:

- **Recognition of settlement risk** – for which products do institutions recognise settlement risk and when does exposure begin and end
- **Limits and monitoring** – how institutions monitor settlement risk in their systems and the extent to which they set limits
- **Failed trades** – how failed trades are monitored and the extent to which settlement risk exposures are adjusted to take account of failed trades
- **Risk mitigation** – the techniques that institutions use to mitigate settlement risk such as membership of CLS and settlement netting
- **Compliance with BIS guidance on settlement risk**

2. Survey composition

InteDelta surveyed a total of 17 institutions between October and December 2014. The composition of the survey group is shown below:

![Figure 1: Survey composition](image)

The “Other” category comprises mainly asset and pension fund managers. 14 of the surveyed institutions were European, with two from Asia and one from the US.

\(^1\) Supervisory Guidance for Managing Risks Associated with the Settlement of Foreign Exchange Transactions
3. Recognition of settlement risk

Table 1 shows the proportion of institutions which recognise settlement risk within their risk management systems, for which products this is recognised and how the exposure is measured.

Table 1: Recognition of settlement risk

<table>
<thead>
<tr>
<th></th>
<th>All institutions</th>
<th>Tier 1 banks</th>
<th>Tier 2-3 banks</th>
<th>Other institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settlement risk is recognised within institution's systems</td>
<td>71%</td>
<td>100%</td>
<td>63%</td>
<td>60%</td>
</tr>
<tr>
<td>For spot FX</td>
<td>65%</td>
<td>100%</td>
<td>50%</td>
<td>60%</td>
</tr>
<tr>
<td>For forward FX and cross currency swaps</td>
<td>76%</td>
<td>100%</td>
<td>63%</td>
<td>80%</td>
</tr>
<tr>
<td>For securities transactions when not settling DVP</td>
<td>35%</td>
<td>75%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>Other transactions</td>
<td>18%</td>
<td>0%</td>
<td>13%</td>
<td>40%</td>
</tr>
<tr>
<td>Settlement risk is recognised on value date only (as % of institutions that recognise settlement risk)</td>
<td>83%</td>
<td>75%</td>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>More sophisticated approach as function of currency pair, product etc (as % of institutions that recognise settlement risk)</td>
<td>17%</td>
<td>25%</td>
<td>20%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Of the total survey sample 71% recognise settlement risk within their risk management systems, rising to 100% for the Tier 1 banks.

The proportion of institutions recognising settlement risk is highest for forward FX and cross currency swaps. A slightly lower proportion recognise settlement risk for spot transactions, the timeliness of information in their systems being the most common reason for not being able to do this (e.g. trades have settled by the time information is reflected in institutions’ systems).

35% of institutions measure settlement risk on securities transactions which do not settle DVP\(^2\), although 75% of Tier 1 banks do so. Of the institutions that do not recognise this risk, most commented that the volume of non-DVP transactions is not sufficiently high to justify capturing settlement risk. One bank commented that “we should but don’t” capture settlement risk on non-DVP transactions. A number have manual sign off procedures surrounding Free of Payment (FOP) transfers.

The majority of institutions restrict the recognition of settlement risk to the previously mentioned products where there is an exchange of principal or securities. Two institutions have a wider definition and recognise settlement risk for the majority of cashflows. One global bank is currently under pressure from its regulator to include a wider definition of settlement risk, including receipts of collateral under a Credit Support Annex (CSA). The bank disagrees with this approach and is resisting moving to a wider definition.

Of the institutions that recognise settlement risk, the majority calculate the amount settling on each day and count settlement risk on value date only. Two institutions have a more sophisticated approach whereby they analyse the period for which they are at risk according to the product, currency pair, time zone and nostro reconciliation procedures.

Most institutions calculate a full daily settlement profile for every day until the maturity of the longest transaction in the portfolio. The peak settlement risk from the profile is then measured against a specific settlement limit. In this way institutions are able to know their maximum settlement exposure until maturity and cap it by means of a settlement limit.

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\(^2\) Delivery Versus Payment
4. Limits and monitoring

Table 2 summarises the approach to limit setting and monitoring of settlement risk amongst the surveyed institutions.

**Table 2: Limits and monitoring**

<table>
<thead>
<tr>
<th></th>
<th>All institutions</th>
<th>Tier 1 banks</th>
<th>Tier 2-3 banks</th>
<th>Other institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settlement risk is subject to limits</td>
<td>59%</td>
<td>100%</td>
<td>63%</td>
<td>20%</td>
</tr>
<tr>
<td>Settlement risk is not subject to limits but is monitored</td>
<td>12%</td>
<td>0%</td>
<td>0%</td>
<td>40%</td>
</tr>
<tr>
<td>Settlement risk is not monitored</td>
<td>29%</td>
<td>0%</td>
<td>38%</td>
<td>40%</td>
</tr>
<tr>
<td>Pre-deal check functionality to check settlement limits prior to trading</td>
<td>53%</td>
<td>100%</td>
<td>50%</td>
<td>20%</td>
</tr>
</tbody>
</table>

All of the Tier 1 banks and 63% of the Tier 2/3 banks establish limits for settlement risk. A much lower proportion of the Other institutions set limits. 29% of institutions neither set limits nor monitor settlement risk.

Where settlement limits are established, the interaction of the settlement and the exposure works in a standard way across most institutions – a single (i.e. non time-banded) settlement limit is set for each counterparty and that represents the maximum settlement risk that can be tolerated on any given day into the future.

In all institutions which establish settlement limits, the limits are set as part of the overall counterparty limit structure and approved through the institution’s process for the approval of counterparty limits (i.e. credit officer sign off, credit committee approval etc).

All of the surveyed Tier 1 banks have an automated pre-deal check tool that enables the front office to enter a trial transaction and check that there are sufficient settlement (and other counterparty) limits available prior to entering into the transaction. 50% of the Tier 2/3 banks and 20% of Other institutions had such functionality. In larger institutions pre-deal check is typically integrated into the front office system as part of the deal entry screens. Institutions without an integrated pre-deal check require the trade to be re-keyed into a separate deal checking application or into the counterparty risk management system.

5. Failed trades

All but one of the surveyed institutions routinely monitor failed trades. In several smaller institutions fails are monitored by the operations function but are not reviewed by risk management. The largest institutions have sophisticated coding mechanisms for failed trades with one having over twenty different codes for failed trades.

Only one of the surveyed institutions made a link between failed trades and extending the period for which settlement risk is recognised. In two institutions failed transactions are recognised as giving rise to an overdraft or lending exposure.
6. Mitigation techniques

Table 3 shows the settlement risk mitigation techniques deployed by the surveyed institutions.

**Table 3: Risk mitigation techniques**

<table>
<thead>
<tr>
<th>Description</th>
<th>All institutions</th>
<th>Tier 1 banks</th>
<th>Tier 2-3 banks</th>
<th>Other institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member of CLS</td>
<td>59%</td>
<td>100%</td>
<td>63%</td>
<td>20%</td>
</tr>
<tr>
<td>Enter into settlement netting agreements</td>
<td>47%</td>
<td>100%</td>
<td>38%</td>
<td>20%</td>
</tr>
<tr>
<td>Perform settlement netting from an operational perspective</td>
<td>53%</td>
<td>38%</td>
<td>40%</td>
<td>53%</td>
</tr>
<tr>
<td>Mechanisms to delay payments</td>
<td>35%</td>
<td>50%</td>
<td>38%</td>
<td>20%</td>
</tr>
</tbody>
</table>

All of the Tier 1 banks surveyed are members of CLS\(^3\), but the proportion of CLS members falls off dramatically for smaller institutions. One of the asset management institutions was not a direct member of CLS but benefited from its custodian’s membership.

60% of institutions which are members of CLS do not recognise settlement risk on transactions that settle through CLS. The remainder continue to show settlement risk even though this has been effectively mitigated. These institutions are therefore somewhat overstating their settlement exposure.

53% of surveyed institutions enter into settlement netting agreements\(^4\). This is 100% for the Tier 1 banks and considerably lower for other institutional types. Where legal agreements are in place, this divided roughly equally between being documented under the ISDA Master agreement and under a separate side letter.

A slightly higher proportion of institutions perform settlement netting from an operational perspective. The majority only perform this when they have a legal netting agreement in place, but two institutions perform operational netting in the absence of a legal agreement. One institution commented that it has a legal opinion that states it has the legal right to net even if there is no explicit legal agreement in place. This view was not articulated by any other institutions.

Only 38% of the institutions which have implemented settlement netting recognise the effect of netting in their settlement risk exposures. The remainder continue to show exposure gross even though settlement risk has been partially mitigated.

38% of institutions have procedures to ensure safe settlement in situations where they enter into large transactions with specific counterparties for which there is a particular credit concern. This would typically involve ensuring that the institution had received cash or securities from the counterparty before delivering on its side of the transaction. Such procedures are only used on an ad hoc basis and it would not be possible to settle all transactions in this way.

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\(^3\) CLS Group (Continuous Linked Settlement) is a specialist institution that provides settlement services to its members in FX transactions via a Payment Versus Payment mechanism that eliminates settlement risk

\(^4\) Settlement (or payment) netting agreements allow two way payments between the same counterparties settling in the same currency on the same day to be legally netted against one another
7. Compliance with BCBS recommendations on settlement risk

In February 2013 the Basel Committee on Banking Supervision issued its guidance note “Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions” (BCBS 241). Table 4 shows the main areas of guidance relevant to this report and our assessment of market compliance (based on both the survey and general market experience).

**Table 4: Compliance with BCBS 241**

<table>
<thead>
<tr>
<th>Guidance</th>
<th>Tier 1 banks</th>
<th>Tier 2-3 banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks encouraged to settle through a Payment vs Payment mechanism (e.g. CLS)</td>
<td>Fully compliant</td>
<td>Some banks compliant</td>
</tr>
<tr>
<td>Banks should set limits for principal risk (i.e. settlement risk)</td>
<td>Fully compliant</td>
<td>Mostly compliant</td>
</tr>
<tr>
<td>Banks should set replacement cost limits (i.e. PFE) for transactions that do not settle through a Payment vs Payment mechanism</td>
<td>Fully compliant</td>
<td>Mostly compliant</td>
</tr>
<tr>
<td>Banks should recognise settlement risk from the time of the unilateral deadline for the delivery of the sold currency to the time when the incoming payment will be received and reconciled</td>
<td>Most banks only recognise for 1 day and do not analyse to this level of detail</td>
<td>Where settlement risk is recognised it is not analysed to this level of detail</td>
</tr>
<tr>
<td>Banks must have good regime for monitoring failed trades</td>
<td>Fully compliant</td>
<td>Mostly compliant</td>
</tr>
<tr>
<td>Failed trades must be accounted for in settlement risk exposure</td>
<td>Generally not compliant</td>
<td>Generally not compliant</td>
</tr>
<tr>
<td>Banks should obtain legal opinions on when settlement finality occurs</td>
<td>Doubt that most banks have done this</td>
<td>Doubt that most banks have done this</td>
</tr>
</tbody>
</table>

As demonstrated by the survey results in previous sections, the practice of setting limits for settlement risk is widespread amongst Tier 1 banks but less so amongst smaller institutions. The BCBS guidelines state that replacement cost (Potential Future Exposure) should still be measured for transactions giving rise to settlement risk. We believe that this is often not performed, particularly by smaller institutions for short dated transactions such as spot FX.

The monitoring of failed trades is generally satisfactorily performed, but it is rare for failed trade information to be accounted for in settlement risk exposure. Most banks assume that settlement occurs on the contractual settlement date and settlement risk is not persisted if there is a fail. Only one institution in our survey persisted settlement risk in this way although two institutions recognise failed trades as giving rise to overdraft or lending exposure.

Most banks recognise settlement risk on the contractual value date. Very few banks have undertaken the more sophisticated analysis recommended by the BCBS that “banks should recognise settlement risk from the time of the unilateral deadline for the sold currency to the time when the incoming payment will be received and reconciled.” Furthermore, few banks have obtained legal opinions on when settlement finality occurs for each product and jurisdiction in which they operate. This contrasts unfavourably with banks’ approach on close-out netting where they generally do obtain legal opinions on the enforceability of netting and adjust their measures of PFE accordingly.
8. Conclusion

Settlement risk is effectively measured and controlled by the largest banks. Many smaller institutions, however, do not recognise settlement risk or if they recognise it do not subject it to limits. Even amongst the banks that do measure and control settlement risk, only a minority of have fully implemented the recommendations of the BCBS, for example by conducting a detailed analysis of when settlement risk begins and ends taking into account product type, timing of settlements, the legal environment and operational controls.

A number of techniques are available to mitigate settlement risk such as membership of CLS and entering into settlement netting agreements. These mitigation techniques are widely adopted by the largest banks but, again, smaller institutions have been slow to adopt these controls.

9. About InteDelta and how we can help

InteDelta helps financial institutions better manage their risk. Through our range of consulting and associated products we provide assistance in areas such as:

- Risk management policies and methodologies
- Target operating model design
- Technology selection, development and implementation
- Market intelligence and benchmarking

We have undertaken a large number of engagements in the field of settlement risk, for example benchmarking best practices, and counterparty risk more generally.

Further Information

If you would like to discuss any of the issues addressed in this White Paper, please contact:

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