

Implications of Collateral Settlement Fails

An Industry Perspective on Bilateral OTC Derivatives



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1. Executive Summary

There is more to a collateral settlement fail than meets the eye; collateral settlement fails impact the participants of a failed transaction while also adversely affecting broader financial markets. Collateral settlement fails are widely viewed as a 'business as usual' nuisance and escape the analysis that other operational failures receive. Industry participants, including buy-side firms, sell-side firms, and custody banks, are focused on preparing for the uncleared/bilateral margin regulations but are not necessarily considering a critical component regarding the daily movement of collateral that imposes an operational burden: collateral settlement fails.

Financial regulators are continuing to seek ways to bolster systemic stability and reduce counterparty credit risk. The Over-The-Counter (OTC) derivatives market is receiving particular focus as market participants will be required to collateralize trading activities against both bilateral and cleared trades. The regulations for bilateral OTC derivatives will result in an increased number of margin calls and associated collateral movements. Even at the prevailing industry-wide average collateral settlement fail rate of 3%,¹ the increase in collateral movements will foster a proportional impact on the volume of collateral settlement fails. Industry participants, already suffering from regulatory burdens that include higher capital and liquidity requirements and spiraling compliance expenditure, will be further impacted by the increase in the volume of collateral movements fails as it is likely to place an additional strain on an organization's operational capacity and capital.

A collateral settlement fail occurs when cash or securities collateral is not delivered or received on the agreed upon date.² Industry participants have varying views on the leading causes of collateral settlement fails; however, there are four common themes:

1. Miscommunication
2. Constrained technology
3. Insufficient collateral
4. Counterparty insolvency

This paper examines the implications and costs of bilateral OTC derivatives collateral settlement fails. Collateral settlement fails represent a break in the collateral settlement chain with participants in this chain only as strong as their weakest link. Assuming industry participants maintain current levels of Straight Through Processing (STP) and automation as well as collateral settlement fail rates, by 2020, the average annual operational cost of remedying bilateral OTC derivatives collateral settlement fails is estimated to rise 407% to \$3.6m for each buy-side firm and 377% to \$2.4m for each sell-side firm.³ Additionally, the annual industry-wide unsupported exposure for bilateral OTC derivatives, which is the total value of collateral settlements that are expected to fail, is likely to exceed \$27bn when applying the average fails rate to the average total value of collateral delivered and received.⁴

Collateral settlement fails result in implications that extend beyond operational costs and the industry-wide unsupported exposure. Industry participants should be cognizant of counterparty credit risk, funding and capital charges, reputational risk, and regulatory standing in order to gain a holistic understanding of the impact of collateral settlement fails.

As regulatory mandates continue to shape the way participants manage collateral, there will be an emphasis on efficiently managing collateralized trading through improved operational processes and system infrastructure. The implications of a collateral settlement fail will garner greater attention as it is expected that the operational cost per firm, along with the industry-wide unsupported exposure, will increase as the volume of margin calls, and thereby collateral settlement fails, increases. In this increasingly risk-averse and cost-conscious environment, industry participants should analyze the implications of bilateral OTC derivative collateral settlement fails and employ industry leading practices in order to proactively manage the impending increase in collateral movements.

¹ Source: PwC Analysis

² For purposes of this paper, misbookings are categorized as collateral settlement fails.

³ This paper analyses the average cost per industry participant. The operational cost of collateral settlement fails is a function of annual volumes of collateral movements, levels of STP and automation, and collateral settlement fail rate.

⁴ The average total value of collateral delivered and received is sourced from the 2015 ISDA Margin Survey which provides data for 42 sell-side participants. Industry level data is not available, but it can be safely assumed that the total value of unsupported exposures due to collateral settlement fails is greater than \$27bn (the unsupported exposure for the ISDA Margin Survey participants is \$26.7bn).

2. Methodology

The information in this paper was collected through interviews with collateral settlement specialists operating within the OTC derivatives market. These specialists represent dealer banks, asset managers, insurance firms, custody banks and technology vendors; see Figure 1: Bilateral OTC Derivatives Interviewees. Asset managers and insurance firms are grouped together as buy-side firms, while dealer banks comprise the sell-side. Custody banks include pure-play custodians as well as those also offering collateral management outsourcing (Outsourcers).

The paper's operational cost model focuses exclusively on buy-side and sell-side operational costs as custody banks and outsourcers process collateral movements on behalf of their clients and maintain differing organizational structures. Collateral settlement specialists that were interviewed (Interviewees) for the development of this paper provided their views/outlook on bilateral OTC derivatives trends, collateral management and settlement, and the implications of a bilateral OTC derivative collateral settlement fail. Furthermore, these specialists were requested to provide collateral movement volume, collateral settlement fail rates, collateral settlement team size, and time spent remedying collateral settlement fails.

The majority of interviewees are based in North America and Europe; with a sub-set based in the Asia-Pacific region; see Figure 2: Location of Interviewees. The data collected provides a directional indication of the trends and costs associated with collateral settlement fails in the bilateral OTC derivatives market.

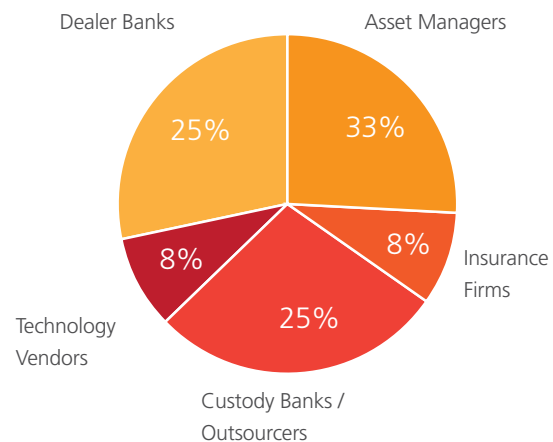


Figure 1: Bilateral OTC Derivatives Interviewees

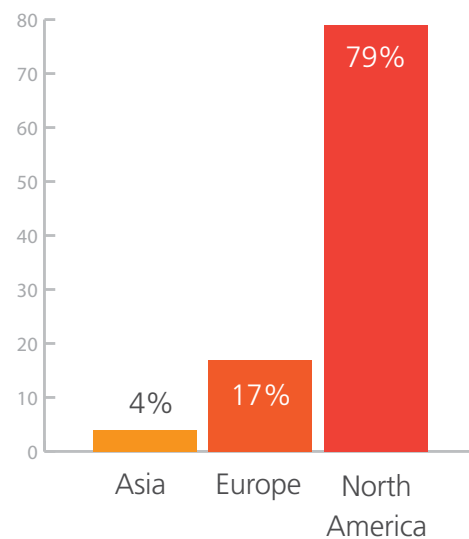


Figure 2: Location of Interviewees

3. Background

3.1. Evolving OTC Derivatives Landscape

As a result of the 2008 financial crisis, collateral management has evolved, moving from a primarily back-office function to an integral part of day-to-day activities within trading, liquidity management, counterparty credit risk and market risk. Driven by regulatory initiatives, risk management practices, and liquidity considerations, there has been an increased focus on achieving greater transparency, improving efficiency, reducing systemic risk and improving collateral mobility.

Regulatory mandates, including Dodd-Frank Act (DFA), European Markets Infrastructure Regulation (EMIR), and Basel III in addition to the BCBS-IOSCO uncleared/bilateral margin requirements framework, will increase the number of margin calls, collateral delivery channels and collateral movements. Additionally, existing collateral agreements may need to be amended, created, or replaced to comply with regulatory requirements. The breadth and depth of these regulations pose significant challenges for participants in the bilateral OTC derivatives market. As the different regulations intersect, participants will need to understand how to address the greater complexities which may overwhelm existing operational processes and system infrastructure.

New CSA Documentation

Global regulations for bilateral OTC derivatives may require participants to manage multiple Credit Support Annexes (CSA)⁵ with a phased implementation beginning on 1 September 2016. Participants that currently manage bilateral OTC transactions against one type of CSA may be required to track, manage, and apply collateral movements against up to four CSAs, including legacy Variation Margin (VM) CSA, legacy Initial Margin (IM) CSA, post-compliance date/regulatory VM CSA, and post-compliance date/regulatory IM CSA. Collateral movements will need to be tracked and accurately applied against the appropriate CSAs, which, due to the increased operational complexity, may result in enhanced risk of collateral settlement fails.

Increase in Margin Calls

Currently, for bilateral OTC derivatives, requirements for threshold and frequency of margin calls are prescribed through the transacting parties' CSAs. Uncleared/bilateral OTC derivatives margin regulation will result in a need to amend and/or execute new CSAs and will require covered entities⁶ to post VM with zero threshold⁷. As a result, for participants that have a pre-existing CSA with a covered entity, the number of margin calls will increase based on the requirement to post VM on a daily basis⁸. For a covered participant that has a pre-existing CSA with another covered participant, the number of margin calls will increase based on the requirement to post two-way gross

IM⁹ at the onset of a trade and after a credit affecting event, and VM on a daily basis. Similarly, custodians and outsourcers must prepare to process a significantly higher number of collateral movements associated with their client transactions.

The new regulations specify that IM cannot be netted with VM nor can it be netted within the corresponding IM between counterparties (i.e. on a gross basis). This will contribute to an increase in the number of payments and daily movements of collateral as individual IM and VM margin calls will be required.

Increase in Collateral Delivery Channels

The regulations introduce a multitude of complexities as participants must manage multiple collateral channels across cleared and bilateral portfolios. Participants with portfolios containing both cleared and bilateral products will be required to separately post collateral to FCMs/SCMs and then to CCPs and counterparties. Additionally, the segregation of counterparty IM will result in a need to engage independent segregation services in third/tri-party segregation models. This may require participants to open new custodial accounts, develop Account Control Agreements (ACAs), and accurately process collateral movements to segregate counterparty initial margin. The aforementioned changes will contribute to an increase in the volume of collateral movements through additional collateral delivery channels and lead to added operational complexity.

The changes in the bilateral OTC derivatives markets, along with the regulatory mandate to centrally clear specific OTC derivatives products, will lead to an increase in margin call volumes. Market participants with centrally cleared products in their portfolio are already subject to stringent collateral and margin posting requirements that may be applied on an intra-day basis in times of market volatility. The fragmentation of central clearing also results in an increase in the number of margin calls and collateral delivery channels as margin calls will be splintered between the various clearing members and clearing venues, each specializing in specific OTC derivatives products. Irrespective of a participant engaging in central clearing or bilateral trading for OTC derivatives, the regulatory impact will result in an increase in the number of margin calls and collateral delivery channels, and subsequently the number of collateral movements and collateral settlement fails.

⁵ A Credit Support Annex is a legal document which regulates credit support (collateral) for derivative transactions. It is usually associated to an ISDA Master Agreement with the trading counterparty.

⁶ A covered entity is defined as any financial entity and systemically important non-financial entity that engages in non-centrally cleared OTC derivative transactions.

⁷ ISDA defines Threshold as follows: It can be zero, but otherwise will typically be defined as either a fixed currency amount or a variable currency amount that changes in response to changes in the credit rating of the party concerned. In context of the expression for Credit Support Amount, any non-zero Threshold will decrease the overall amount of collateral that a party is required to deliver - it makes the Credit Support Amount from that party's perspective smaller.

⁸ It is expected that by 2020, the majority of bilateral OTC derivatives participants will be considered 'covered entities'.

⁹ Participants will be required to post IM as their notional crosses a cascading threshold set forth by the regulators.

3.2. Four Themes of Collateral Settlement Fails

The leading causes of collateral settlement fails can be categorized into four main themes: Miscommunication, Constrained Technology, Insufficient Collateral, and Counterparty Insolvency. In addition to these themes, collateral settlement specialists also highlighted specific challenges with timely generation and disbursement of margin calls.

These challenges may be exacerbated for industry participants that manually calculate margin calls (e.g. spreadsheet-based calculations) and as a result, are exposed to the risk that they will maintain uncollateralized exposures on their trading books. However, it should be noted that when an industry participant fails to call for margin, a collateral settlement fail does not materialize because the margin is never called. The four collateral settlement fail themes are further examined below.

Miscommunication

Miscommunication of collateral movement instructions is seen as the leading cause of collateral settlement fails. Collateral movement messages with incomplete or incorrect reference data generally result in a collateral settlement fail if the issue is not resolved by the agreed upon settlement time. For example, when a participant does not include complete SSI¹⁰ information in the collateral movement instructions, the counterparty may not have enough information to properly execute the collateral movement by the required settlement time.

Further miscommunication can stem from situations in which there is a lack of clarity regarding whether or not timely settlement has occurred. Although collateral movements leverage the same financial plumbing as Delivery Versus Payment (DVP) transactions, custodians still have issues interpreting free delivery collateral movements. This may ultimately lead to a collateral settlement fail if the custodian places collateral into the wrong account. For example, a custodian for a buy-side participant may receive cash collateral and apply the free delivered cash collateral to an omnibus account rather than the correct sub-account. In such a situation, the collateral settlement fail will typically be identified only after the buy-side participant performs reconciliation between expected collateral balances and the custodian records.

Additionally, cross-border trades with different settlement cut-off times may result in collateral settlement fails. These fails are more pronounced when one or both of the trading counterparties have manually intensive processes (i.e. limited instances of STP and automation). Participants transacting in a cross-border environment may have less time to complete the margin call process due to the non-harmonized settlement/business operations window, making participants more likely to experience a collateral settlement fail.

Constrained Technology

Constrained technology hinders the ability of participants to communicate in a standardized way limiting the use of STP and automation. For example, after a counterparty confirms collateral movement instructions, they will send the instructions to their custodian. Automated participants use a standard messaging protocol to communicate with custodians. In some cases, the counterparty may be forced to send a fax to instruct the movement of collateral because either they do not have standard messaging protocol capabilities or the custodian does not. The manual processing of faxed settlement instructions leads to time lags and/or incorrect data entry, which ultimately can result in a collateral settlement fail.

A custodian's/counterparty's inability to use industry-standard messaging for broker release letters also proves to be a challenge and a cause of collateral settlement fails. The broker release letter requires approvals (sign-offs) from the participant and the custodian to affect the movement of collateral. The use of fax to send and complete a release letter is a manual process that can be difficult to complete in a timely manner.

Many custodians lack the ability to perform intra-day reconciliations to track and account for buy-side pledged or received collateral. Insufficient record keeping capabilities, driven by batch processing of collateral movements, results in the reactive identification of a fail as opposed to proactively identifying issues before they become a fail.

Constrained technology also limits a participant's ability to effectively manage their collateral inventory. For example, collateral that has been earmarked to satisfy a future margin call may not show up in the collateral system as pledged until an end-of-day reconciliation is performed and the pledges are manually entered into the system. From the time the initial collateral selection is made and the reconciliation is performed, the same collateral that was initially earmarked to satisfy a specific margin call may be selected to satisfy a separate margin call. This situation may result in additional collateral settlement fails as the original collateral is unable to be used to settle multiple margin calls.

¹⁰ SSIs (Standard Settlement Instructions) are settlement instructions governing the delivery of financial instruments between two counterparties.

"Miscommunication of collateral movement instructions is seen as the leading cause of collateral settlement fails."

Insufficient Collateral

Insufficient collateral relates to a participant's inability to post the required amount or type of collateral. This lack of sufficient collateral may be a consequence of a daisy-chain failure, poor inventory management, or non-conformance with wrong-way risk and concentration limit requirements.

Daisy-chain failures can be both a result and a cause of collateral settlement fails by affecting the original failing counterparty in addition to downstream participants. A daisy-chain failure can be defined as a series of collateral settlement fails in which an initial failure to deliver collateral or complete a substitution causes a chain of subsequent fails as the party expecting to receive the security in the initial transaction fails to deliver to its counterpart in the second transaction and leads to additional downstream collateral settlement fails.

Participants may also be burdened by poor collateral inventory management. Visibility into the available collateral pool is a prerequisite to efficiently sourcing and delivering collateral. A lack of up-to-date information regarding collateral can prove onerous, particularly in situations where participants are unable to locate collateral that is expected to be returned from a counterparty's account. In turn, collateral will need to be sourced from the market, which can be a time intensive and costly process. If the counterparty is unable to source the collateral from the market, a collateral settlement fail may result.

Wrong-way risk and concentration limits may be imposed by uncleared/bilateral margin regulations in certain jurisdictions and restrict the type of collateral that a participant is allowed to post. Such requirements are put in place to limit counterparties from becoming over-exposed to particular assets or issuers. These requirements are likely to increase the instances of collateral fails in scenarios where the counterparty to a trade does not possess diverse types of eligible collateral.

Counterparty Insolvency

As experienced during the 2008 financial crisis, counterparty insolvency, although not a business-as-usual occurrence, may result in a collateral settlement fail. During the crisis, as participants defaulted, their counterparties failed to receive collateral, thereby negatively impacting the confidence in the market and leaving participants exposed to failing counterparties. Counterparty insolvency, although a rare occurrence, has effects reaching beyond collateral settlement fails.

"Visibility into the available collateral pool is a prerequisite to efficiently sourcing and delivering collateral. A lack of up-to-date information regarding collateral can prove onerous, particularly in situations where participants are unable to locate collateral that is expected to be returned from a counterparty's account."

4. Operational cost and Industry-Wide Unsupported Exposure

4.1. Operational Cost of Collateral Settlement Fails

As an industry participant, understanding the current collateral settlement fail remediation process and underlying costs, in addition to the future impact of collateral settlement fails, is imperative in determining whether an investment in operational and technological redesign is warranted. In order to assist industry participants assess the impact of bilateral OTC derivatives collateral settlement fails, an operational cost model was developed using data collected from interviewees.

The operational cost model focuses on buy-side and sell-side participants and provides average annual operational cost estimates for buy-side and sell-side participants. This model utilizes an average of annualized respondent data projected through the year 2020 as uncleared/bilateral margin requirements are likely to impact the majority of participants.¹¹

Model Assumptions

Each aspect of the collateral settlement fails remediation process has an associated time value cost. Through participant interviews it was brought to light that the most time and the largest cost associated with remedying a collateral settlement fail is spent researching and understanding the root cause of the fail, and communicating and collaborating with counterparties, clients and/or custodians to remedy the fail. The operational cost model inherently accounts for rates of STP and automation through the data provided by interviewees. Additionally, the model does not account for possible cost savings associated with offshoring and outsourcing. For both the buy-side and sell-side, the average annual time spent remedying a fail per FTE in conjunction with the average number of fails (utilizing the industry-average collateral settlement fail rate of 3% multiplied by the average number of collateral movements) was translated into an FTE estimate through 2020.

The model additionally takes into account collateral settlement fail remediation rates at each step of the process and utilizes industry-average salaries and the total cost to staff an employee (including benefits and occupancy).

The projections were made holding all other factors constant. For example, the model assumes that no new technology was implemented to relieve some of the added burden of the increased collateral movement volume and complexity.

Collateral Settlement Fails Remediation Process

Figure 3: Buy/Sell-Side Collateral Settlement Fails Remediation Process represents a typical collateral settlement fails remediation process, from the time a fail is identified through resolution/escalation. A cost driver and time element was assigned to each activity identified in the remediation process. The cost drivers include the number of collateral movements, the number of collateral settlement fails, and the number of collateral settlement fails escalated to management, senior management, and relationship managers.

Furthermore, many participants believe that the rate and volume of collateral settlement fails will increase during the next five years as complexity increases and participants that previously did not have to post collateral on a daily basis adjust their operations to meet regulatory standards.

¹¹ The operational cost of collateral settlement fails for custody banks are not outlined in the theoretical cost model as the cost structure differs from buy-side and sell-side participants. Many top tier custodians use a combination of STP and outsourcing and maintain individualized cost structures. Furthermore, the underlying root cause of collateral settlement fails, and thereby the operational cost, is often a function of the client, as opposed to the custodian.

Collateral Settlement Fails Remediation Process



1. Reconciliation and Identification of Fails

On an intra-day or daily basis, participants match the trade population against the expected values in a collateralized portfolio. Once reconciliations are performed, participants identify breaks in their bilateral records; these breaks are flagged as collateral settlement fails.

2. Internal Research

Participants analyze the identified collateral settlement fails and perform a root cause analysis. This analysis requires communication between the front, middle, and back office. It is possible for a fail to be remedied at this stage if the identified collateral settlement fail is caused by an internal error (e.g. incorrectly entered SSI information).

3. External Communications

If the root cause of the collateral settlement fail is attributed to an external source, participants may need to collaborate with their counterparty, client, and/or custodian. This communication enables participants to re-confirm trade details and understand where collateral is physically located. Through external communications, a participant may gather pertinent details giving them visibility into why the counterparty was unable to post the required collateral in the allotted time. Furthermore, a participant may come to an agreement with the counterparty to remedy the collateral settlement fail.

Most collateral settlement fails are remedied at this stage. Participants are only as strong as the weakest link in their collateral settlement chain; a participant that has a low fail rate may still spend a substantial amount of time remedying fails if their counterparty consistently has issues and requires additional communication. Furthermore, small buy-side firms have identified counterparty unresponsiveness as a challenge when resolving issues and collateral settlement fails. The additional delay in communication leads to higher than average time spent on external communication.

4. Escalations

According to interviewees, collateral settlement fails are remedied, on average, within two business days. If a collateral settlement fail is not remedied in the average timeframe, the fail is likely to be escalated to management for remediation. Further escalation can reach senior management or relationship managers. The majority of collateral settlement fails do not require management intervention. However, for the fails that are escalated, the cost associated with each is inherently higher than those remedied earlier in the process due to the engagement of senior and relationship management.

Buy-side

For buy-side participants, the estimated average annual operational cost per organization attributed to the collateral settlement fails remediation process increases from \$631k in 2015 to \$3.6m in 2020. The estimated average Full Time Equivalent (FTE) per organization increases from 4 FTEs in 2015 to 24 FTEs in 2020.

Figure 4: Buy-Side Operational Cost shows the operational cost per year along with the required FTE count over the next five years. The buy-side interviewees varied in size and levels of STP and automation, therefore, participants should examine their collateral settlement operations to garner a precise understanding of their own collateral settlement fails remediation costs. In other words, a participant that is highly automated and/or has a small OTC derivatives portfolio will likely see a smaller operational cost increase and associated FTE increase than a participant with low levels of STP and automation and/or a large OTC derivatives portfolio.

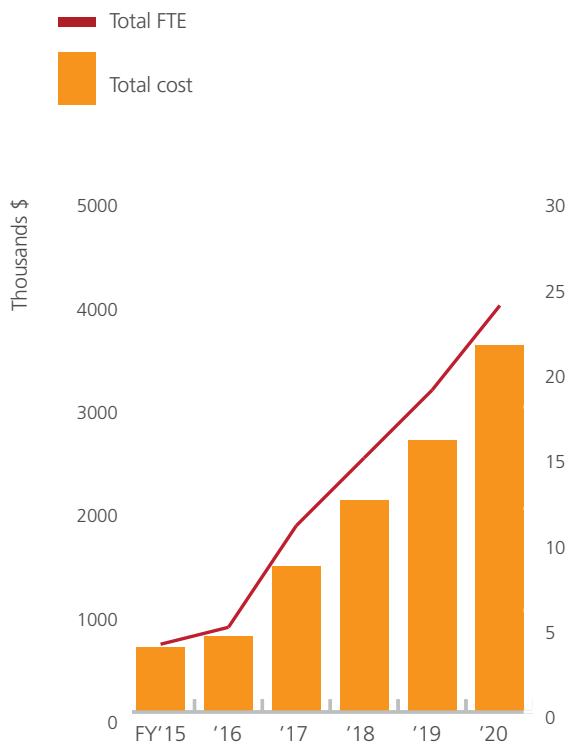


Figure 4: Buy-Side Operational Cost

Sell-side

For sell-side participants, the estimated average annual operational cost per organization attributed to the collateral settlement fails remediation process increases from \$502k in 2015 to \$2.4m in 2020. The estimated average per organization FTE count increases from 3 FTEs in 2015 to 16 FTEs in 2020.

Figure 5: Sell-Side Operational Cost illustrates both the operational cost for sell-side participants over the next five years, as well as the required FTE count. A participant can anticipate higher or lower operational costs depending on the size of their OTC derivatives portfolio and levels of STP and automation. It should be noted that many sell-side participants offshore much of the collateral settlement process and therefore maintain a cost structure that is outside the scope of the model.

Sell-side interviewees tend to have higher levels of STP and automation and stronger relationships with custodians (usually internal to their organization) than the buy-side. The higher levels of STP and automation reduces the amount of time needed throughout the process of remedying a collateral settlement fail, while also preventing the collateral settlement fail rate from exceeding the industry-wide average of 3%. Although the sell-side tends to have higher collateral movement volume than the buy-side, the 3% industry-wide average collateral settlement fail rate remains constant. The ability for sell-side participants to quickly and efficiently interact with their custodians also helps reduce the amount of time needed to remedy a collateral settlement fail. However, it will be necessary under the uncleared/bilateral margin rules for covered participants to segregate IM at an independent third-party custodian. Although the sell-side is also likely to witness an operational cost increase for remedying collateral settlement fails due to the uncleared/bilateral margin rules, this increase is expected to be more pronounced for buy-side industry participants.

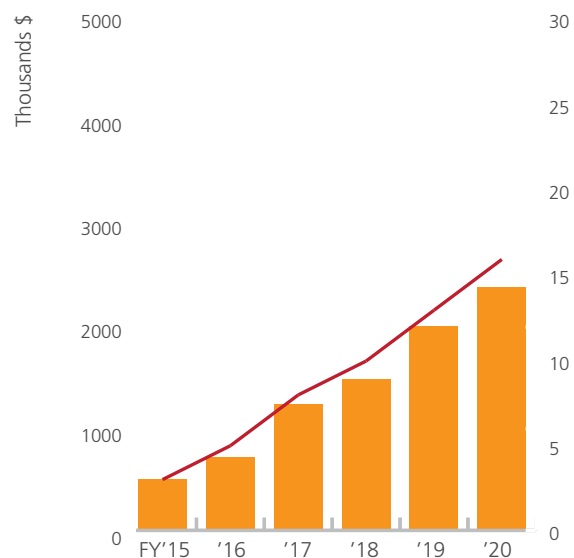


Figure 5: Sell-Side Operational Cost

4.2. Industry-Wide Unsupported Exposure

Interviewees stated a view that the industry-wide economic risk associated with collateral settlement failures is relatively low. However, as regulatory changes come into effect, the volume of bilateral OTC derivative collateral movements will increase, and with that, the number of collateral settlement fails and associated costs are likely to rise proportionally. Although the average industry collateral settlement fails rate is 3%, for some participants this rate can be as high as 10%. Per the 2015 International Swap Dealers Association (ISDA) Margin Survey,¹² the average annual value of bilateral OTC derivatives collateral assets received and delivered for 42 sell-side firms amounted to \$889.5bn. Using the average collateral settlement fail rate, the annual industry-wide unsupported exposure due to collateral settlement failure for these sell-side firms is estimated to be nearly \$27bn. This figure represents the amount of uncollateralized exposure that participants experience. When also factoring in buy-side participants and the remaining sell-side participants, the overall unsupported exposure is likely to be much larger and should be further examined by the industry.

¹² <https://www2.isda.org/functional-areas/research/surveys/margin-surveys/>

5. Considerations of Collateral Settlement Fails

An increased volume of collateral settlement fails will result in a greater focus on operational cost and the industry-wide unsupported exposure. Participants should also be cognizant of how a collateral settlement fail affects counterparty credit risk, funding and capital charges, reputational risk, and regulatory standing. These considerations are further examined in this section.

5.1. Counterparty Credit Risk

Collateral settlement fails result in uncollateralized exposures on the books of a trading counterparty and combined collateral settlement fails may represent a larger underlying problem especially in times of market stress. A single collateral settlement fail does not necessarily equate to a defaulting counterparty, however it can call into question the liquidity and stability of the failing counterparty. A series of collateral settlement fails or a non-responsive counterparty can be indicative of a failing counterparty. For example, during the 2008 financial crisis, a major bank stopped posting collateral and responding to inquiries. Due to the tumultuousness of the crisis, some participants were left posting collateral to a failing counterparty and ended up incurring losses that they were unable to retrieve in a timely manner (e.g. general unsecured creditors). Participants need to actively manage counterparty credit risk and minimize the instances of collateral fails in order to ensure they are engaging with credit-worthy counterparties.

5.2. Funding and Capital Charge

Collateral settlement fails impose a funding cost on participants. Participants lacking visibility into their pool of available collateral may not be able to make informed decisions regarding the future use of collateral. For example, when a participant expects collateral to be returned, they may plan for that specific collateral to be used elsewhere for various business purposes, including covering a short sale, selling an investment, and/or satisfying a margin call. If the participant does not receive the collateral by the cut-off time, they run the risk of failing on their obligation or having to obtain replacement assets in the open market at a higher cost (e.g. daisy-chain fail). The cost of replacing the assets is dependent on the number of days the fail is outstanding. On average, a collateral settlement fail is resolved within two days, thus the participant would need to borrow the securities for that duration.¹³ Participants must additionally take into account the added time value associated with borrowing replacement assets and resolving the fail. As participants manage collateral settlement fails, they need to be aware of the funding implications on their ability to make new transactions, maintain on-going transactions, and complete open transactions.

Bilateral OTC derivatives collateral settlement fails or disputes that persist for longer durations on the books of sell-side participants may also result in a variety of additional costs under Basel III and other rules. Under Basel III Standardized, the shortfall in collateral will directly impact Risk Weighted Assets (RWAs)¹⁴. This leads to a requirement for participants to hold additional capital on their balance sheets in order to cover the

¹³ Data on the cost of funding is not readily available, nor is it specifically tracked by the interviewees due to the inherent complexity. Participants stated that the low-interest rate environment is a cause of the limited focus on funding cost. As the interest rate rises, the funding cost is expected to go up proportionally.

¹⁴ When compared with Basel III Standardized, the effect of collateral shortfall under Basel III Advanced is lower as the simulation of future conditions is more significant in the overall result.

counterparty exposure. Participants will also be subjected to a higher Credit-Value-Adjustment (CVA)¹⁵ for mark-to-market exposures that are partially uncollateralized. The Net Stable Funding Ratio (NSFR)¹⁶ and Supplementary Leverage Ratio (SLR)¹⁷ requirements for banks will be costlier to maintain, because even a tiny shortfall of collateral will essentially lead to all collateral received from a counterparty being ignored for these purposes. In addition, the limit on banks' Liquidity Coverage Ratio (LCR) included in the new Basel III liquidity standards is likely to increase the Funding Valuation Adjustment (FVA) currently borne by banks. The funding valuation adjustment is deployed when an uncollateralized or imperfectly collateralized derivatives position is hedged with a collateralized position.

5.3. Reputational Risk

The prevalence of collateral settlement fails may erode a participant's reputation within the market. A participant that fails to deliver collateral or is perceived to fail regularly may see a direct negative impact on their business. Counterparties are likely to lose trust in the participant that is failing, and as a result, the participant may experience a loss of business relationships and/or may be subject to heightened collateral requirements.

Participants are increasingly focused on utilizing various metrics to understand and report on the collateral settlement process. The metrics highlight the counterparties that consistently fail to deliver. In many cases, the counterparties with the highest rate of collateral settlement fails will be flagged as risks and reconsidered as business partners from a Front Office and Relationship Management perspective. As a result, the counterparty's reputation is likely to be damaged, thus making it harder to build relationships and transact with new participants. Furthermore, many buy-side firms perform a substantial vetting process when selecting counterparties and a poor reputation or a consistently higher-than-average fail rate may deter these participants from engaging with those counterparties.

A damaged reputation makes it difficult to attract new clients/ counterparties. This is particularly true from a custodial perspective, whose activities are highly visible to clients. A custodian that fails to affect timely movement of collateral will likely leave their client carrying an uncollateralized exposure on its books. Any failure or consequence of the failure affects the custodian's reputation and could potentially deter new clients from engaging with the custodian.

5.4. Regulatory Standing

Regulators are continuously looking for ways to increase transparency and reduce systemic risk. For example, regulators are seeking heightened visibility into trading positions and exposures by asking industry participants to report OTC derivatives transactions to a central trade repository. Some participants in Europe are additionally required to submit all collateral values associated with OTC derivatives to a central trade repository. Participants in the European markets also have to adhere to Central Securities Depositories Regulation (CSDR). This regulation is primarily settlement related, but it does include provisions for settlement fail penalties and defines a protocol for executing mandatory buy-ins against failing transactions. This mandate is expected to considerably impact liquidity and pricing. Interviewees compared the potential impact of the CSDR to other regulatory initiatives such as Basel III, MiFID II, and Financial Transaction Tax (FTT).

Similar efforts to minimize settlement fails have been undertaken in non-OTC derivatives markets. As an example, the Treasury Market Practices Group (TMPG), sponsored by the Federal Reserve Bank of New York, recommends a financial charge to reduce settlement fails¹⁸ for DVP transactions in U.S. Treasury, agency, debt, and agency Mortgage-Backed Securities (MBS). Securities free delivered as collateral were excluded from the aforementioned recommendations. This scenario sometimes created an undesirable disconnect between markets (DVP vs. free delivery). In order to harmonize the practices in DVP and free delivery markets, ISDA best practices for collateral processing recommend that market participants cross-honor claims when a free-delivery fail causes settlement fails in other transactions.

¹⁵ The CVA is a capital charge that accounts for the possibility of mark-to-market losses associated with the deterioration of the creditworthiness of the counterparty.

¹⁶ As part of Basel III reforms, the NSFR is a new prudential liquidity rule aimed at limiting excess maturity transformation risk in the banking sector and promoting funding stability.

¹⁷ The Basel Committee's Basel III capital framework introduces a minimum 3% Tier 1 leverage ratio that takes into account both on-balance sheet assets and off-balance sheet exposures. The SLR represents the U.S. banking agencies' implementation of the Basel III Leverage Ratio. Under this approach, advance approaches firms must maintain a minimum SLR of 3%. U.S. bank holding companies, that have been identified as global systemically important banks are subject to enhanced SLR standards (eSLR) that will effectively require them to maintain an SLR in excess of 5%.

¹⁸ It should be noted that although the TMPG strongly recommends the adoption of the fails charge trading practices, the TMPG's market practice recommendations are voluntary.

6. Reducing Collateral Settlement Fails – Leading Practices

The demands and challenges created by the uncleared/bilateral margin regulations will require buy-side firms, sell-side firms, and custody banks to adjust their operational processes and systems. Technology and STP are rapidly morphing from discretionary undertakings to critical-to-success components that create value and enable efficiency. Implementation of leading practices, will allow participants to strategically position themselves to handle the upcoming increase in margin call volume while limiting the occurrence of collateral settlement fails.

"Effectively managing collateral inventory on a real-time basis is integral to reducing operational risk and increasing efficiencies in the collateral management process."

Golden Source for Trading Documentation

As a result of the additional CSA documentation requirements, participants may be required to renegotiate their CSAs to include updated margin terms and conditions. Participants must promote collaboration and communication across operational groups to ensure proper application of trading documentation and data.

Proliferation of multiple data sets and siloed data sources pose a prominent challenge. The development of a golden source for data and documentation through an enterprise-wide repository provides operational integrity and efficiencies while eliminating duplicative data stores. The use of a central repository will allow for greater understanding and application of data and information across operational groups. This will ultimately lead to fewer instances of miscommunication internally and externally and thus decrease the number collateral settlement fails.

Collateral Inventory Management and Visibility

Enhanced visibility into collateral inventory provides participants with the ability to ensure that they are able to satisfy margin calls and select the optimal collateral for current margin calls. Many participants perform end-of-day collateral reconciliations and therefore do not have a clear understanding of the collateral available on a real-time basis to satisfy a margin call. Effectively managing collateral inventory on a real-time basis is integral to reducing operational risk and increasing efficiencies in the collateral management process. Furthermore, robust collateral inventory management will assist participants in collateral forecasting and substitution, which can further reduce the occurrence of collateral settlement fails.

Automated Margin Call Generation

Participants using spreadsheet-based manual processes to support margin calculation are likely to experience a higher rate of uncollateralized exposures because they are unable to finalize and distribute margin calls in a timely manner. Furthermore, manual processes limit a participant's ability to track disputes in real-time and maintain a comprehensive view of exposures, commitments, and adjustments. Participants should utilize systems that automate the margin call generation process in order to prevent a delayed distribution of a margin call. A delayed margin call leaves the trade uncollateralized and the participant exposed to additional risk. Although these instances are not treated as collateral settlement fails, these events can lead to additional concerns as the uncleared/bilateral margin regulations require the daily posting of VM and a missed margin call would leave a participant outside of regulatory compliance.

Electronic Call Messaging and Matching

Leveraging solutions that support electronic messaging and matching of margin calls, agreement of calls, and movements of collateral can enable participants to efficiently process margin calls, while tracking exposures, commitments, adjustments, and disputes. An industry-standard margin messaging system that is used by both parties to a trade can limit the need for communication through email, faxes, and phone messages. In addition, a messaging system can provide participants with a clear audit trail that can increase levels of transparency for counterparties.

Standardized Collateral Movement Communication

Leveraging standard messaging platforms for collateral processing and settlement helps to ensure successful management of complex collateral processes. Automated enrichment of SSIs and account information through a global database in addition to standard messaging to communicate collateral movements is particularly critical given the growth of interconnected players and segments in the collateral markets.

"Participants that utilize industry utilities focused on the enrichment and maintenance of SSI data consistently report a lower-than-average fail rate."

Participants that utilize industry utilities focused on the enrichment and maintenance of SSI data consistently report a lower-than-average fail rate. Incorrect or incomplete reference data for SSIs was identified as the most common cause of collateral settlement fails. Mitigating the occurrence of SSI issues will greatly improve collateral settlement success rates.

Participants should work towards eliminating the use of faxes to communicate account information and settlement instructions and should leverage standardized communication systems to automate communication with their custodians and counterparties. Currently, many participants use faxes for communication; faxes lead to higher rates of failure and increased operational cost. Standardized communication platforms require fewer human touchpoints and result in an efficient and secure transfer of data. Automated SSI messages will lower costs, streamline trade processing, and provide participants with the ability to divert time and resources to other value-add activities.

Payment Netting

Participants should additionally look to minimize operational costs associated with collateral settlement by netting variation margin collateral payments into a single movement between settlement agents. Payment netting will further reduce collateral settlement fails by limiting the total number of collateral movements. Buy-side firms, sell-side firms, and custody banks, will be able to benefit from payment netting in addition to the associated benefits of intra-day reporting, reduced costs through fewer collateral movements, and limited operational risk due to the opportunity to reduce the occurrence of collateral settlement fails.

Collateral Accounting

Accurate accounting/record-keeping of collateral held on books, collateral pledged to various counterparties, and collateral settlement fails can help participants better manage the deployment of collateral. As an example, a view into collateral posted at various Financial Market Utilities (FMUs) with a clear understanding of encumbered status, market value, haircut value, etc. can help participants recognize if they are under/over-collateralized. These insights can further enable participants to proactively manage the impact of market events (e.g. credit downgrades, etc.) and make informed decisions.

Live Reporting

Participants should have the proper technology and processes in place to monitor collateral settlement status in real time. End-of-day and/or intra-day reporting provide necessary information, however they do not provide on-demand information and are therefore outdated upon receipt. Live reporting of settlement status enables participants to actively identify potential collateral settlement fails prior to failing, thus allowing for preventative actions.

7. Conclusion

As regulatory changes permanently realign interactions between participants, collateral settlement fails will migrate from a manageable operational inconvenience to a cost and time-intensive operational imperative. Participants should use the information presented in this paper to transition away from the inertia associated with existing processes and should determine a course of action to limit the occurrence and effects of collateral settlement fails.

While participants may view collateral settlement fails as an esoteric, back-office function, the operational cost of remedying collateral settlement fails is likely to dramatically increase. Furthermore, the annual industry-wide unsupported exposure due to collateral settlement fails will become progressively more significant as the overall annual value of fails increases.

The average collateral settlement fail rate of 3% for bilateral OTC derivatives may stay constant over the next five years, but the absolute number of collateral settlement fails will increase. Participants can mitigate the impact of the increase in collateral settlement fails through implementation of the leading practices. Participants should look to increase STP to limit operational costs and provide greater visibility into one's operations. It should be noted, however, that participants are only as strong as the weakest link in their collateral chain and should thus encourage counterparties, clients, and service providers to implement the same leading practices.

Decreasing profitability and increasing operational costs are likely to incent participants to leverage shared solutions for non-competitive functions that promote operational efficiencies, industry standardization and mutualization of costs. Participants that follow the leading practices will be best positioned to lower their rate of collateral settlement fails, lessen the operational cost burden and reduce industry-wide unsupported exposure.

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