

The Counterparty Gap

A study for the ICMA European Repo and Collateral Council on the trade registration models used by European central counterparties for repo transactions

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Executive Summary

Central counterparties ('CCPs') play an increasingly important role in Europe in helping market participants manage their counterparty and market risk. They are viewed as a critical financial market infrastructure and a key pillar of the European financial system.

Enhanced use of CCPs has been a key regulatory sentiment during the post-crisis reform period across a range of asset classes. A series of important regulatory initiatives such as the 2009 G20 commitment on OTC derivatives and the capital rules contained within Basel III, particularly the Leverage Ratio, have served to increase the overall proportion of capital market activity that is cleared.

While at first glance the timing element of the CCPs' trade registration models may look technical in nature and possibly not worthy of significant consideration, in fact the opposite is the case. In a number of circumstances, the process and timing used by a CCP to accept or reject a trade is a fundamental risk management consideration for the counterparties to the original trade but one that may be misunderstood or overlooked by them. Often, time to CCP acceptance will be very short but there are a number of occasions where this timing is extended due to an unforeseen technical, operational or network event.

Our analysis, which was conducted during the Spring and Summer of 2016, highlights that there are periods in the trade registration process where there is ambiguity as to the legal status of a CCP destined trade – (i) between the point of execution and the point of CCP acceptance of a trade; and (ii) in the period immediately following a trade rejection decision by a CCP. We are referring to this issue as 'the counterparty gap'.

This ambiguity has arisen as trade registration models have evolved and CCPs focus increasingly on their ability to manage operational risk. This has led to a trend in recent years for some CCPs to switch from being counterparty at the point of trade execution to the point where the trade advice has been received and accepted by them.

The ICMA ERCC Committee has determined a set of recommendations that should increase the transparency of the counterparty gap issue and provide a basis by which market counterparties can more effectively manage the risk of the trade registration process that is being borne by them.

By working together now to clarify the position regarding the counterparty gap issue, market participants and infrastructure providers will achieve an enhanced operating and risk management environment for CCP cleared business and ensure that any future increase in CCP activity e.g. for Dealer to Client trades, can be managed more comfortably.

The recommendations include:

All repo trades intended for central clearing should, as a matter of best practice, be contingent upon the CCP's acceptance and will otherwise be cancelled. For Automated Trading System ('ATS') trades the ATS should make this clear within its rules/documentation; and for bilateral trades this should be agreed between the parties and reflected in writing.

To provide essential operational risk management information to market participants and to create incentives for trade providers and CCPs to optimise the speed of their trade acceptance process, the time gap between a repo trade being executed / electronically matched and it being accepted by the CCP should be measured and the timings made transparent to users.

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Introduction

Why this paper

CCPs play an increasingly important role in Europe to help market participants manage their counterparty and market risk. They are viewed as a critical financial market infrastructure and a key pillar of the European financial system.

Enhanced use of CCPs has been a key regulatory sentiment during the post-crisis reform period across a range of asset classes and a series of important regulatory initiatives such as the 2009 G20 commitment on OTC derivatives and the capital rules contained within Basel III, particularly the Leverage Ratio, have served to increase the overall proportion of capital market activity that is cleared.

ICMA, primarily through its repo industry participants group, the European Repo and Collateral Council ('ERCC'), has been a long-standing supporter of CCPs and recognised early the risk management and netting benefits that could be generated for market participants. ICMA played an important role in 1998 and 1999 by working with CCPs and market participants to develop the first inter-bank repo clearing services in Europe.

The majority of European repo market activity is already CCP cleared and it is expected that this amount will grow as more market participants become directly involved in the CCP clearing process. The ICMA ERCC believes it is important to increase the level of awareness of how the sometimes complex process flow that supports CCP activity is structured and, where possible, to educate and inform market participants on any areas of risk.

This short study focuses on a specific issue ('the counterparty gap') that emerged from a broader analysis of CCPs' trade registration models. The issue relates to risk borne by market participants arising from different trade registration models and the different timings and procedures used by the CCPs to manage trade acceptance and trade rejection scenarios. The analysis covers trades that are executed via automated trading systems, traded bilaterally or executed on a name give-up basis via voice brokers.

This paper contains recommendations from the ICMA ERCC on a number of changes to market best practice that, when adopted, could reduce the risk to market participants arising from the counterparty gap issue.

Structure of the paper

In Chapter 1 the paper provides detail on the different trade registration models used by the major repo clearing CCPs and the time at which that the CCP becomes counterparty to a trade. Detail is also provided on what would happen if the CCP rejects the trade. The information is presented in the form of a summary table to ease the process of review and comparison.

Chapter 2 highlights a number of areas of ambiguity in the trade registration process that have emerged as changes have been made in the process flow over time and the interplay between dealers, CCPs and trade providers has evolved. We comment on the areas of ambiguity and provide a degree of context in which they should be viewed.

In Chapter 3 we summarise the multiple different legal contract scenarios that arise based on the exact time at which a CCP becomes counterparty to a trade, the method by which the original trade was executed and whether or not the trade is supported by documentation.

Scope and methodology

The study focused on the trade registration models of the following six European CCPs, each of which have a significant repo clearing service:

- BME Clearing
- Cassa di Compensazione e Garanzia ('CC&G')
- Eurex Clearing
- LCH Ltd
- LCH SA
- Nasdaq Clearing

The goal was to work with the CCPs during the Spring and Summer of 2016 in a collaborative way to ensure that information and data pertaining to the trade registration process was captured and reported correctly and that the process was transparent to the CCPs involved.

The study was achieved by engaging with the CCPs at CEO level to request their support for the initiative and then providing a questionnaire to each CCP containing questions relating to their business model, operational model and risk and legal model. Follow-up conference call(s) and emails were organised with representatives of each CCP to discuss their questionnaire responses and, if necessary, to clarify and/or elaborate responses provided.

The findings of the analysis were reviewed by the ICMA ERCC Committee and recommendations were presented to the contributing CCPs and the major ATs and trade matching services.

The scope of ICMA ERCC's initial analysis was narrow in focus and sought to review specifically the operational, risk and legal aspects of the CCPs' trade registration processes. The purpose of the analysis was to highlight any differences in the approach used by the CCPs to manage their trade registration processes that would be of particular interest to ICMA ERCC members and that may warrant further consideration or review.

The analysis highlighted the 'counterparty gap' issue as being significant and as an area that needs to be addressed. The remit of this paper is to focus solely on the counterparty gap issue and to propose recommendations for how the risks being borne currently by market participants can best be managed.

Chapter 1: timing of CCP as counterparty

The table on the following page summarises the responses, relating to the counterparty gap issue, that were provided by the CCPs.

- Q1. Can the CCP clear bilaterally executed trades?
- Q2. Can the CCP clear anonymous ATS executed trades?
- Q3. Time at which the CCP becomes counterparty to the trade?
- Q4. Does the CCP prescribe the form of contract before becoming counterparty?
- Q5. What happens if the CCP rejects a trade?

Questions 1 and 2 provide information on the trade capture sources that each CCP can support; in particular whether the CCP is able to clear anonymous repo trades that were executed on an ATS and/or to clear bilaterally executed trades that are sent to the CCP via a trade matching and confirmation facility.

Questions 3, 4 and 5 provide information on the important questions regarding the timing when the CCP becomes counterparty to the trade, the status of the trade in the period prior to a CCP receiving and accepting the trade and the period following a CCP rejection of a trade.

It is apparent from the information provided by the CCPs (see summary in Table 1) that there are currently different models for trade registration of repo trades in operation across the European CCPs. The material differences relate to the exact timing of the CCP assuming counterparty responsibility for the trade and the different types of trade that CCPs apply their trade registration models to.

Timing differences range from an instantaneous trade registration by the CCP, as used by Eurex for inter-bank business ('Open Offer structure') and linked to the moment of **Execution / Match** of the trade, to a registration model used by the other CCPs for inter-bank business based on the CCP's **Receipt and Acceptance** of the trade for clearing.

Table 1: Summary of CCP Responses Relating to the Counterparty Gap Issue

	(1) Can CCP clear bilaterally executed trades?	(2) Can CCP clear anonymous ATS executed trades?	(3) Timing that CCP becomes counterparty to the trade?	(3.1) Exceptions?	(4) Does CCP prescribe form of contract before becoming counterparty?	(5) What happens if CCP rejects trade?
BME Clearing	Yes	No	Receipt and Acceptance <i>Moment of counterparty confirmation following receipt, interrogation and registration of trade by CCP</i>	n/a	No CCP silent	CCP silent
CC&G	Yes	Yes	Receipt and Acceptance <i>Moment of counterparty confirmation following receipt, interrogation and registration of trade by CCP</i>	1) <i>eMid</i> trades at time of execution 2) <i>Tri-Party</i> trades at time of execution	No CCP silent <i>n/a for eMid and tri-party trades</i>	CCP silent
Eurex Clearing	Yes	Yes	Execution Moment of execution on trade platform	<i>GC Pooling Select Invest: Binding declaration of intent to execute a trade whose legal conclusion is contingent on CCP novation. Novation is subject to cash pre-funding for the opening leg</i>	Open Offer transactions : not applicable GC Pooling Select Invest transaction : No. The binding declaration of intent is set out in the Eurex Repo rules & regulations	If CCP doesn't novate the trade due to missing cash pre-funding, the Select Invest Bank may request to stop further novation attempts after two unsuccessful novation attempts. The binding declaration of intent would dissolve
LCH Ltd	Yes	Yes	Receipt and Acceptance <i>Moment of counterparty confirmation following receipt, interrogation and registration of trade by CCP</i>	n/a	No CCP silent	CCP silent
LCH SA	Yes	Yes	Receipt and Acceptance <i>Moment of counterparty confirmation following receipt, interrogation and registration of trade by CCP</i>	n/a	No CCP silent	CCP silent
Nasdaq Clearing	Yes	Yes	Receipt and Acceptance <i>Moment of counterparty confirmation following receipt, interrogation and registration of trade by CCP</i>	n/a	No CCP silent	CCP silent

The Receipt and Acceptance model is the most common model used by the CCPs currently. It is used for all of the repo business of BME Clearing, LCH Ltd, LCH SA and Nasdaq Clearing and for the inter-bank business of CC&G.

Eurex Clearing's model for Dealer to Client trades in respect of the GC Pooling Select Invest product does not use the Open Offer structure and utilises instead a modified version of the Receipt and Acceptance, with an additional condition relating to liquidity that also needs to be satisfied; but otherwise Eurex Clearing uses Open Offer.

CC&G uses the Open Offer framework in respect of repo trades executed on eMid and for tri-party trades; but otherwise it uses Receipt and Acceptance.

Where CCPs have an inter-operable link, as is the case between CC&G and LCH SA in respect of Italian government bonds, then alignment of trade registration timing is a requirement.

In recent years a number of the CCPs that previously supported the Open Offer framework have switched to the Receipt and Acceptance model. The explanation provided by the CCPs for this change was that the Receipt and Acceptance model allows them to manage their operational risk more effectively.

The technical means by which the CCPs receive matched trades varies slightly depending on their business model and which trade providers they are connected to. For ATS originated trades, it is relatively straightforward in that the 'execution' of the trade that occurs on the ATS is also the 'match' so there is no difference in timing between the trade execution and the technical match. The matched trade is then sent, via an electronic message, from the ATS to the CCP for clearing.

For bilaterally executed trades, the process is more complex. A trade that is executed bilaterally, irrespective of whether it was traded directly between the bilateral counterparties or organised by a voice-broker on a name give-up basis, requires that the trade be subsequently matched electronically in a trade matching system. The point of 'execution' and the point of 'match' can therefore be viewed as distinct.

Our analysis identified three models for matching bilaterally agreed repo trades and routing them to a CCP for clearing:

- the bilateral trade being matched within a dedicated matching service operated by the CCP or a group company and the resultant matched trade being automatically incorporated into the trade registration process on a Receipt and Acceptance basis (*as used by Nasdaq Clearing and BME Clearing*);
- the bilateral trade being matched within an ATS system and the trade registration process being achieved on a Receipt and Acceptance basis but thereafter being co-mingled with anonymous ATS originated transactions (*as used by Eurex Clearing and CC&G*); and
- the bilateral trades being matched within Euroclear's industry trade capture and matching system 'ETOMS' and the matched trade then being routed to the CCP, via an electronic message, where the trade goes through the trade registration process on a Receipt and Acceptance basis (*as used by LCH Ltd and LCH SA*).

Chapter 2: the counterparty gap issue

‘Mind the gap’

While at first glance the timing element of the CCPs' trade registration models may look technical in nature and possibly not worthy of significant consideration, in fact the opposite is the case. In a number of circumstances, the process and timing used by a CCP to accept or reject a trade is a fundamental risk management consideration for the counterparties to the original trade but one that may be misunderstood or overlooked by them. Often, time to CCP acceptance will be very short but there are a number of occasions where this timing is extended due to an unforeseen technical, operational or network event.

Irrespective of whether the trade was executed anonymously on an ATS or transacted directly between two counterparties and the trade sent to clearing by a trade capture and matching system, any trade sent to a CCP that uses the Receipt and Acceptance trade registration model poses a question as to the legal status of the trade during the period between the execution of the trade and point where the CCP assumes counterparty responsibility.

Our analysis confirms that none of the European CCPs using the Receipt and Acceptance model prescribe the form of the contract and offer no view as to the legal status of the trade in the period prior to the CCP assuming counterparty responsibility. If the ATS on which the trade was executed does not explain in its rules and regulations relating to the status of CCP destined trades during this period, or in the case of bilaterally executed trades if the dealers do not agree the status of the trade from the point of execution nor have subsisting documentation in place that specifies a treatment for CCP destined trades, then each of the original counterparties are left with two critical risk questions:

- 1) does my trade exist?
- 2) if so, who is my counterparty?

An equivalent counterparty gap risk exists if a trade is rejected by a CCP for any reason. Our analysis indicates that in the majority of cases the CCPs are silent on what the status of a trade would be if it is rejected by the CCP for any reason¹ (see Table 1).

Similar to the counterparty gap issue which arises between execution and acceptance by the CCP, if the treatment of a trade that is rejected by the CCP has not been covered in the rules and regulations of the ATS or agreed between the original bilateral trade counterparties at the outset, the legal status of the trade can be ambiguous and the original counterparties are left with the same fundamental risk questions:

- 1) if the trade is rejected by the CCP, does my trade still exist?
- 2) if so, who is my counterparty?

In such an event, there are likely to be different answers to these questions depending on whether the original CCP destined trade was entered into on an anonymous basis or whether the trade was entered into on a bilateral basis by counterparties who are known to each other. For bilaterally agreed trades, considerations would include whether it is desirable to have a bilateral trade with that counterparty, whether the price of the trade would be appropriate given it is no longer a CCP trade and whether bilateral documentation (Global Master Repurchase Agreement, 'GMRA') is in place with the bilateral counterparty.

Not unreasonably, the CCPs view themselves as being responsible solely for their own risk and focus their communication on what happens to a trade once it has been accepted by the CCP for clearing. CCPs do not seek to explain nor take responsibility for the motivation or intention of the dealers or the ATSs / intermediaries if a trade is rejected and in the majority of cases remain silent.

From a market participant's perspective, the only way to build a comprehensive understanding of the trade registration model for CCP destined trades, in addition to understanding the specific risk characteristics of the CCP, is to also understand the inter-play between dealers' bilateral documentation, the rules and regulations of the ATSs / intermediaries and the rules and regulations of the CCPs.

¹ It is worth stressing that trade rejections by CCPs are rare because the CCPs are credible, heavily regulated, infrastructure providers and they make significant effort in conjunction with their trade providers to operate a robust control framework that filters out ineligible trades prior to them being sent to the CCP for clearing.

Chapter 3: contract outcome scenarios

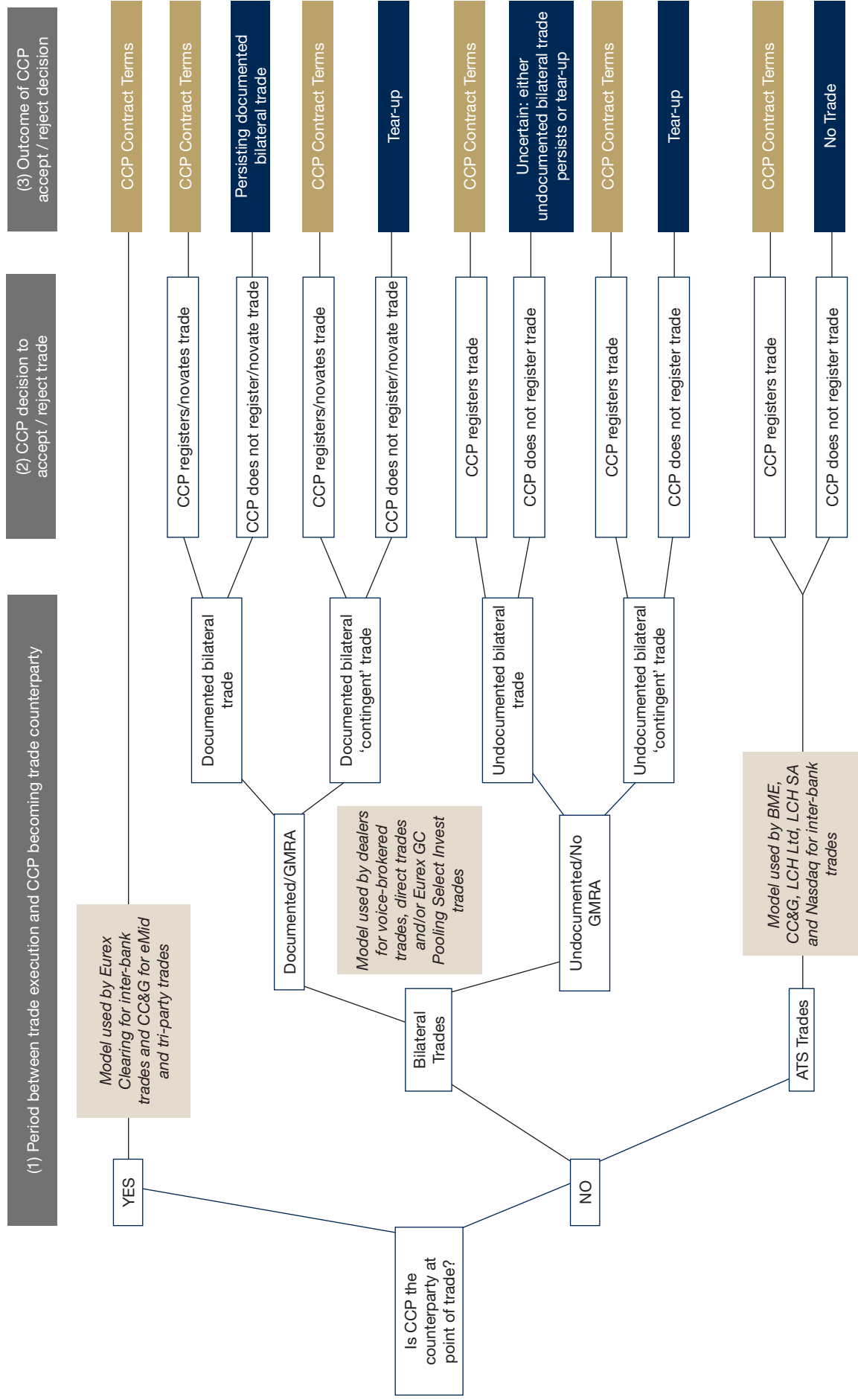
The decision by a CCP to accept or reject a trade is the critical step in the trade registration process.

For trades that are accepted by the CCP for clearing, it is worth highlighting two different legal scenarios that can arise from the CCP's action. If a CCP destined trade was entered into anonymously via an ATS, then the legal contract that arises when the CCP receives and accepts the trade thereby becoming counterparty, is the first time that a legal contract arises. However, if the trade was entered into on a bilateral basis between counterparties then they would have a bilateral contract from the point of execution, whether documented or not, but that bilateral contract would be novated to a pair of CCP contracts when the CCP accepts the trade and assumes full counterparty responsibility. Following novation, the CCP contracts replace the bilateral contract.

While an 'accept' decision for a CCP eligible trade is straightforward in that it automatically leads to a CCP contract being created, it is less clear what the outcome will be if a trade is rejected. In this event there are a number of possible outcomes and each will depend on the following factors:

- whether the trade was entered into on an anonymous ATS or with a bilateral counterparty;
- for an ATS trade, whether the CCP trade registration model is Open Offer or Receipt and Acceptance;
- for a bilateral trade, whether the counterparties had a subsisting GMRA/documentation in place or instead traded on an undocumented basis;
- for a bilateral trade between counterparties with a subsisting GMRA/documentation in place, whether the supporting documentation included specific provision for CCP destined trades that are subsequently rejected by the CCP.

The following schematic seeks to illustrate the various outcome scenarios that could arise from a rejection decision and highlights the period prior to and then immediately following the CCP decision to accept or reject the trade.



The five scenarios highlighted in blue on the previous page are summarised below and represent different possible outcomes that may arise from a CCP rejection decision. Each outcome would represent a risk for the participant that would need to be managed

Table 2: Contract Outcomes Where CCP Rejects Trade

	ATS or Bilateral Trade	Outcome
1	Bilateral trade	Persisting documented bilateral trade
2	Bilateral trade	Tear-up
3	Bilateral trade	Uncertain: either undocumented bilateral trade persists or tear-up
4	Bilateral trade	Tear-up
5	ATS (anonymous) trade	No trade ²

² Subject to ATS rules.

Summary and Conclusion

'A complex picture'

The analysis of the various European CCP trade registration models has highlighted that a number of different models exist with specific risks attached to each. It is important that the risks inherent in this process are made transparent so that market participants can manage them effectively.

The changes by some CCPs in recent years away from an Open Offer registration structure with the CCP contract arising from the point of execution to a Receipt and Acceptance model, is understandable from an operational risk perspective but has had the effect of transferring an amount of risk from CCPs onto market participants.

While the analysis has focused on the CCPs' trade registration model, it is clear that the interplay between the dealers, the ATSs / intermediaries and the CCPs is important when considering the overall risk picture. An important method to improve transparency and make this situation less complex is for the ambiguity that exists currently regarding the status of trades in the period between execution and Receipt and Acceptance by the CCP, and in the period immediately following a rejection by a CCP, to be clarified.

ATS:

Industry-wide, the majority of European CCP cleared repo trades are executed on ATSs (*estimated at >95%*) and in the majority of cases with the CCP becoming counterparty when the trade is received and accepted by the CCP. For ATS originated transactions, clarification of the counterparty gap issue can be achieved in the following way:

- the status of the trade in the period prior to the CCP registering the trade should be determined by the ATS / intermediary in its rules and regulations; and the ATS / intermediary should also advise in its rules and regulations that the executed trade is contingent on the CCP accepting the trade

Bilateral:

Industry-wide, bilateral trades account for a small proportion of European CCP cleared repo trades (*estimated at <5%*)³. For bilaterally executed trades, clarification of the counterparty gap issue can be achieved in the following way:

- the status of a trade in the period prior to the CCP registering the trade should be agreed by the original trade counterparties in a way that is consistent with market convention and industry best practice; and the original trade counterparties should decide how best to document their repo trades and adhere to market convention and industry best practice regarding CCP destined trades being agreed as CCP contingent trades.

The critical step in the trade registration process flow is the CCP acceptance or rejection of a trade. In the majority of cases, the CCP's confirmation of acceptance (or in exceptional circumstances, rejection) should be the trigger for a dealer to know whether the trade actually exists and who their counterparty is. In many respects, this can be viewed as being equivalent to a counterparty finality consideration. Timely reporting by CCPs to their clearing members of the real-time trade acceptance or rejection process is necessary to equip dealers to manage their risk effectively.

The clarification of the counterparty gap issues will provide market participants with certainty on a trade's status at all points in its lifecycle. In the event of a bank default or, as will more likely be the case, in the event of a market-wide operational event that may impact the ability for the CCP and settlement process to occur, a dealer will be better able to judge the implications of the situation and whether it would be beneficial to take mitigating action to manage her/his liquidity position.

By working together now to clarify the position regarding the counterparty gap issues, market participants and infrastructure providers will achieve an enhanced operating and risk management environment for CCP cleared business and ensure that any future increase in CCP activity e.g. for Dealer to Client trades, can be managed more comfortably.

³ However, for BME Clearing and Nasdaq Clearing they account for 100% of trades.

Recommendations

ICMA ERCC promotes as best practice that all repo trades should be documented. For ATS/CCP trades this includes their respective rules/documentation, whilst for bilaterally organised trades this is achieved through agreed GMRA's and should include appropriate trade confirmations.

All trades intended for central clearing should, as a matter of best practice, be contingent upon the CCP's acceptance and will otherwise be cancelled. For ATS trades the ATS should make this clear within its rules/documentation; and for bilateral trades this should be agreed between the parties and reflected in writing.

- Where the applicable CCP involvement is not on an 'Open Offer' basis, ATSs should explain clearly within their rules/documentation the status of a trade that has been executed in anticipation of CCP clearing, but not yet registered by the CCP. This should include the ATS explaining clearly that any trade rejected by the CCP is automatically cancelled and that appropriate procedures are in place for such exceptional events.
- For bilateral trades executed in anticipation of CCP clearing but not yet registered by the CCP, it should be clearly stated that the trade is contingent upon CCP registration. This should be reflected in writing, by the trader and in any associated confirmation (unless included in the applicable GMRA's as a mutually agreed negotiated clause).

Clarifying via a market convention that all CCP destined trades are CCP Contingent Trades highlights that it is important that everything is done to ensure that, to the extent reasonably possible, the time gap between a trade being executed and it being accepted by the CCP is minimised.

- Dealers should have transparency on the length of time it takes for all trades (*ATS and bilateral*) to progress from the point of electronic match to the point of CCP's Receipt and Acceptance, meaning: (1) length of time for the matched trade to be sent from the ATS (execution) or the trade matching service to receipt at CCP gateway; and (2) time from receipt at CCP gateway to CCP acceptance as counterparty to the trade.
- Asking for transparency in this way should serve to: (1) provide essential operational risk management information to dealers; and (2) provide incentives to ATSs and CCPs to optimise the speed of their trade acceptance processes.
- Dealers will need to consider any implications for the point at which they represent within their internal systems that these trades exist. The assumption is that these trades are captured within internal risk and control systems from the point of execution, despite the fact that some of them might fail to be accepted by the applicable CCP and hence be cancelled.
- CCPs should be encouraged to provide trade acceptance, or rejection, confirmation messages to dealers in the fastest economically rational time possible. This may require investment by the CCPs in reporting systems and STP messaging, but can be justified because the trend by CCPs towards becoming counterparty from the point of trade registration, instead of trade execution, has shifted significant operational risk onto the dealer community. Timely CCP reporting of trade registration is important to allow dealers to manage this risk.

It is important that consideration is given to the applicability of an equivalent CCP Contingent Trade market convention for cash bonds. The cash bond community will need to understand the implications of the current CCP registration model for their market and what the CCP Contingent Trade convention is seeking to achieve for repo. It would increase complexity and create additional operational risks if the cash bond community elect to pursue a different approach to the repo market. A dialogue is being initiated with relevant cash bond market stakeholders to discuss the situation and advise them of the steps the ICMA ERCC plan to take for market best practice in the repo market.

About the International Capital Market Association (ICMA)

ICMA represents institutions active in the international capital market, including investors, issuers, banks and broker-dealers, intermediaries and infrastructure providers. It has more than 500 members located in 60 countries. ICMA's market conventions and standards have been the pillars of the international debt market for almost 50 years, providing the framework of rules governing market practice which facilitate the orderly functioning of the market. ICMA actively promotes the efficiency and cost effectiveness of the capital markets by bringing together market participants, including regulatory authorities and governments.

About the ICMA European Repo and Collateral Council (ICMA ERCC)

The ICMA ERCC is a special interest group established under the auspices of ICMA to bring together the major institutions active in Europe's cross-border repo and collateral markets.

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ICMA would also like to thank the members of the ERCC Committee who contributed to the analysis and determined the recommendations and agreed the revised trading repo trading guidelines and market best practice.

About the author

John Burke is an independent consultant who specialises in CCP, repo & collateral and change & transformation initiatives.

Prior to setting up Arc Financial Consulting Ltd in 2016, John worked for 17 years at LCH where he helped create and subsequently led LCH's fixed income clearing service ('RepoClear'). John's leadership of the RepoClear service included the development of the major products and services that underpin the service today and he was the business head in 2008 for the RepoClear and SwapClear services at the time of the Lehman default and was responsible for the successful post-default close-out of their bond/repo and interest rate swap positions. The notional principal of Lehman's interest rate swap portfolio at the time of the default was in excess of \$9 trillion. John was also heavily involved in the LCH management and industry response to the Euro sovereign debt crisis.

Prior to this John worked in the strategy team at the London International Financial Futures Exchange ('LIFFE') and was a Fund Manager at BZW Investment Management. He has also worked at County NatWest Investment Management and in the Psychology team within the Management Services Division of the Metropolitan Police.

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