

CCP resilience and recovery – Impact for the CCP users

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Introduction

Back in 2009, in a bid to improve the management of potential counterparty and liquidity risks in the derivatives markets, the G20 countries agreed on mandating the use of a central counterparty (CCP) for clearing standardised over-the-counter (OTC) derivatives trades. Mandatory CCP clearing reduces the overall risk, provided the CCP itself is safe. Hence, mandatory CCP clearing for selected derivatives was combined with even stricter standards for CCP resilience and CCP recovery.

In the European Union (EU), mandatory clearing for OTC interest rate products will be implemented from June 2016 onwards. Regulation (EU) No 648/2012 of 4 July 2012 on OTC derivatives, central counterparties and trade repositories (the so-called “EMIR” Regulation) sets out CCP resilience requirements. The EU Commission is currently reviewing selected aspects of this “EMIR” Regulation and also intends to propose requirements for CCP recovery and resolution as ultimate risk tools. EMIR itself is based on the international CPMI-IOSCO Principles for Financial Market Infrastructures (PFMI), published in April 2012. In mid-2015, CPMI and IOSCO started to check whether further additional guidance on CCP resilience or recovery standards is appropriate, and a market consultation is expected to be launched in the summer of 2016.

In this article we consider what risks a clearing member or its clients incur when clearing their trades via a central counterparty. Clearing members may share part of the loss when another clearing member defaults in extreme but plausible markets (part 1 of this article). If things get even worse, and the CCP itself becomes at risk, this will lead the CCP to use pre-arranged recovery measures (part 2 of this article).

Box 1 – Main EU CCPs and their relevance for Belgium

There is currently no central counterparty established in Belgium. However, CCPs are relevant for Belgian markets, clearing members and central securities depositories (CSDs). A malfunctioning of a European or third country CCP will have an impact beyond the CCP's domestic borders. This is why the EMIR Regulation stipulates a CCP supervisory college for each EU CCP.

The most relevant CCPs for both the European Union and Belgium are Eurex Clearing AG in Frankfurt, LCH. Clearnet Ltd in London and LCH.Clearnet SA in Paris, given their share in clearing activity for listed derivatives,

OTC derivatives and repos. They clear Belgian markets, have Belgian clearing members and clients, and use Belgian CSDs to settle or to hold collateral.

TABLE 1 MAIN EU CCPS RELEVANT FOR BELGIUM

Central counterparty	Main markets cleared	Belgian clearing members	Belgian Central Securities Depositories
LCH Clearnet SA	Euronext markets, including Euronext Brussels	9	Euroclear Bank, Euroclear Belgium, NBB SSS
LCH Clearnet Ltd	Interest Rate Swaps, Repos, including OLO repos	3	Euroclear Bank, NBB SSS
EurexClearing AG	Major euro CCP / interest rate derivatives / repos	2	Euroclear Bank

Source: NBB.

These three CCPs might also become part of the same group, together with the Italian CCP CC&G. Indeed, a merger was announced between the Deutsche Börse Group and the London Stock Exchange Group. This proposed consolidation could to a large extent be driven by the CCP activities of the groups. The precise way in which the CCP activities might be restructured is difficult to predict but could include a merger of future group CCPs, a re-arranging of clearing activities between CCPs, or a cross-CCP clearing or margining. Each of these arrangements would allow CCP customers to clear more trades and hold bigger positions while providing a smaller amount of collateral. This would also further concentrate or interconnect the risks to be managed by the (combined) CCP(s). Consequently, this could attract the scrutiny of the financial stability authorities, as well as the competition authorities, since a single CCP would further concentrate the risk and operate with less collateral overall, and have even more systemic impact if a problem arises.

In general, a new single CCP could be created by merging existing CCPs. A single CCP could improve market liquidity, as the market in a given instrument would no longer be split between the sub-set of participants that clear solely via one particular CCP. Also, the merged CCP would benefit from economies of scale. Furthermore, from the point of view of the participants, netting effects would occur across more products that are now cleared in the same CCP, thus reducing the collateral needed. Clearing several product classes in a single CCP provides collateral reduction benefits for clients, although regulations – such as EMIR – rightly limit the extent of netting allowed across the products or product classes in a portfolio. The prospective merger could offer further possibilities in this respect, e.g. if (selected) CCP clearing services are offered via one CCP of the new group. Indeed, Eurex Clearing AG has substantial activities in interest rate futures that might be nettable with the LCH.Clearnet Ltd interest rate products. An alternative to the creation of a single merged CCP is the establishment of links between the separate CCPs. A CCP link is an arrangement whereby two or more CCPs become mutual counterparties. That allows a market participant clearing contracts via one CCP to clear a contract with a market participant that uses another CCP. Also with CCP links, there are more netting options for exposures held by market participants, and their related collateral needs diminish. Linked CCPs have counterparty risk on each other that also has to be managed. A comparable arrangement is the establishment of cross margining across CCPs, thereby offsetting the cleared positions held with two CCPs

and thus diminishing the required margins. This again implies that the CCPs now have a risk on each other, and that needs to be managed.

A good rough indication of how big a CCP is, or how much risk it manages, consists in looking at the overall initial margin amounts it receives and at its default fund resources. Although the products cleared and the specific risk management methods used by the CCPs do differ, the overall structure and requirements for initial margin and default fund calculations are prescribed by the EMIR regulation. The data in table 2 are thus to a certain extent comparable across CCPs. In case of a clearing member default the initial margin of the defaulter and the whole default fund covering the clearing service can be used to cover the CCP losses.

TABLE 2 PREFUNDED COVERAGE RESOURCES AVAILABLE TO THE MAIN EU CCPs
(in € million)

Central counterparty	Initial margins collected	Default fund resources
LCH Clearnet SA	23 238	3 266
LCH Clearnet Ltd	77 340	5 434
EurexClearing AG	47 022	3 637

Source: CPMI-IOSCO quantitative disclosure framework data, third quarter 2015, as disclosed by the CCP. Initial margins are summed over all clearing members. Where a CCP has more than one default fund, the sum of the sizes of all default funds is taken.

1. Protection of central counterparty clearing in the event of a clearing member default

CCP clearing comprises the substitution of counterparts to a trade, whereby the CCP interposes itself and becomes the seller to the buyer and the buyer to the seller. Consequently, the clearing member – i.e. the direct participant in the CCP – assumes its obligation vis-à-vis the CCP, eventually on behalf of the buyer and/or the seller – i.e. the indirect participant in the CCP.

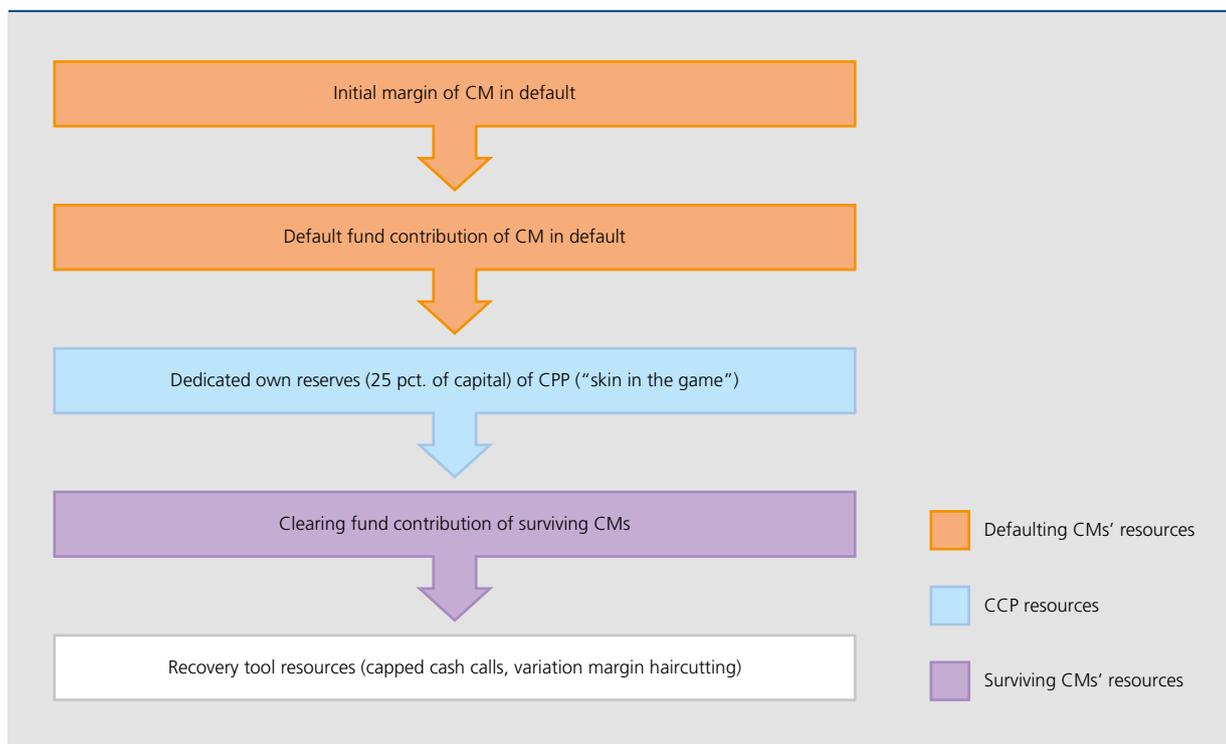
In the absence of a clearing member default, the overall position of the CCP, summed over all clearing members, is zero: the CCP has a matched book. The CCP must therefore have the necessary resources to cope with a clearing member default.

The chart below represents the resources available to the CCP to cover its obligations if a clearing member defaults, as required by EMIR. It is called the CCP default waterfall, because the layers of coverage are used successively as the preceding cover is exhausted. All waterfall resources are prefunded, as opposed to the resources available to the CCP for recovery purposes (see below, point 2).

In principle, variation margin is exchanged at the end of the day between each clearing member and the CCP, to set off their mutual exposure. While no CCP calls variation margin continuously, nor can it do so, clearing member positions and their values also change during the day. To protect the CCP, its potential future exposure vis-à-vis a clearing member is covered by initial margins and the default fund.

The CCP's exposure to a clearing member is first covered by the initial margin layer provided to the CCP that covers the clearing members' own house positions and its clients' positions, respectively. In the event of margin erosion, intraday margin calls can be made. Subsequently, the default fund contribution of the defaulting clearing member is used.

CHART 1 CCP DEFAULT WATERFALL



Prefunded resources are indicated in colour

In the European Union, before using the default fund contributions of surviving members, the CCP has to contribute a quarter of its own minimum equity resources. This so-called "skin in the game" mechanism discourages the CCP from relying too readily on the default fund contributions of surviving clearing members, but instead encourages it to set sufficient initial margin requirements.

After that, the default fund contributions of the surviving clearing members are used. According to standard practice, to cover the risk that the CCP incurs, all clearing members mutualise any losses in excess of the margins that the defaulter posted to the CCP and – at least in the EU – after the "skin-in-the-game" tranche of the "waterfall" has been used.

In the unlikely event that the default fund does not provide sufficient cover, the CCP's remaining capital is at stake. Before a CCP uses all its capital, recovery measures can be implemented: in that case however, the financial resources available to the CCP are not prefunded but only contractually specified in the CCP rulebook.

Below we consider selected aspects of the risks confronting a clearing member or its client when clearing via a CCP, and the risks that a CCP has to take into account in designing its own resilience. A clearing member may face liquidity stresses due to CCP margin calls (point 1.1), a clearing member's client may find that the chosen margin model affects the portability of its positions if its clearing member defaults (point 1.2), and the clearing member may lose its default fund contribution if another member defaults (point 1.3). The consequences of CCP recovery measures for clearing members or their clients are considered under point 2 of this article.

1.1 Margin calls and the mitigation of avoidable liquidity stress for clearing members

In a way, variation or initial margin – when called – will always be potentially pro-cyclical. The EMIR regulatory technical standards require a CCP to manage the avoidable pro-cyclicality when it calls margin. To that end, margin calculation

needs to be sufficiently conservative, and sudden calls or cliff effects are to be avoided. This approach can avoid liquidity stresses for clearing members and the overall market.

The various approaches for initial margin calculation allowed under EMIR⁽¹⁾ reduce the pro-cyclicality effects but have diverging impacts as regards the degree to which they result in under-margining – that is clearly not acceptable – or in over-margining – that represents the cost of mitigating pro-cyclicality.

The EU Commission is currently assessing the effectiveness of the EMIR margining requirements, paying specific attention to their pro-cyclicality. A July 2015 report of the European Systemic Risk Board (ESRB)⁽²⁾ provides input to the Commission in this respect and sets out some recommendations. Firstly, CCPs calling margin should use metrics to measure both the cover obtained and its pro-cyclicality. Further, the CCP's discretion to set and call initial margin "add-ons" is also considered. These add-ons are called to take into account the market liquidity of a contract, for instance, or the concentration of a clearing member's position⁽³⁾. Specific add-ons are also applied in the case of collateral called from clearing members that is subsequently re-used for counterparty credit mitigation between interoperable CCPs⁽⁴⁾. These constitute good risk management practices. CCPs usually also call "additional margins" if the prefunded default fund resources occasionally breach the minimum cover requirement. While this is acceptable practice, this type of additional margin call ought not to occur too frequently, or replace the default fund contributions.

1.2 Protection of a clearing member's clients – Relevance of the segregation model for the porting of clearing members' client positions

In the current "normal" markets, the initial margin that the CCP collects from the clearing member is intended to cover the potential future exposure on the (portfolio of) contracts that the clearing member clears over the margin period of risk (MPOR)⁽⁵⁾. For that purpose, the clearing member provides initial margin collateral to the CCP, the collateral being pledged separately for its own positions and for the segregated positions of its clients.

The clients of a clearing member want to maximise the chance of their positions and related collateral being ported to a surviving clearing member, should their clearing member default. Various segregation models exist, and the model chosen, together with the MPOR, affects portability.

The positions of all clients of a clearing member are usually grouped in a single account with the CCP. There are two forms of this client omnibus account. In the "net client omnibus" account model, the individual client positions net each other out and the CCP registers the net clients omnibus position and receives the related margin collateral on a "net basis". Normally, a minimum MPOR of two, or – for OTC derivatives – five days is required to calculate the margin. Clients do provide more margin but not to the CCP: they provide it to their clearing member where their (gross) position and the related margin is held.

Alternatively, in the "gross client omnibus" accounts model, the position and margin of each separate client is held with the CCP on behalf of that client, on a "gross basis" per client. Nevertheless, the CCP can use the margins of all clients of a single clearing member to cover these clients' positions if the clearing member defaults. In the US, a one day MPOR is applied as standard for this "gross client" initial margin if calculated over "on-exchange" trades⁽⁶⁾.

- (1) See EMIR CCP RTS Art. 28 on margin pro-cyclicality. EMIR provides as possible options: create a 25 pct. margin buffer, include a stressed period in the margin calculation, or set a floor on margin. For the diverging impacts of pro-cyclicality mitigation and margin risk sensitiveness, see Murphy, David: Vasios, Michalis and Vause, Nick (2014), "An investigation into the pro-cyclicality of risk-based initial margin models", Bank of England Financial Stability Paper no 29.
- (2) ESRB report on the efficiency of margin requirements in limiting pro-cyclicality of 28 July 2015. It should be noted that this ESRB report also proposes affording policy makers scope for intervention in this area. Margin add-ons could be used to mitigate systemic risk via a macro-prudential use of margin (and haircut requirements), for both CCP clearing and bilateral clearing margining, whereby an authority would set margins above the minimum EMIR requirements.
- (3) To restrict the concentration of clearing member positions, CCPs may also use concentration limits. For margin calculation purposes, EMIR or its Regulatory Technical Standards (RTS) also requires position concentration to be considered relative to the market and its impact on the required liquidation period (Art. 24 ff. EMIR CCP RTS). Position concentration is also to be taken into account for stress testing purposes (RTS Art. 52).
- (4) I.e., in a CCP interoperability arrangement. On the re-use of initial margin collateral for CCP interoperability mitigation purposes, see Art. 52 and 53 EMIR. For a further analysis, see the ESMA Final report on "Possible systemic risk and cost implications of interoperability arrangements" of 1 March 2016.
- (5) Also called the liquidation period, i.e. the period needed to hedge or close that contract or portfolio. EMIR also specifies to what extent netting is allowed in a portfolio, based on estimated co-movements across products.
- (6) CCPs offer clearing services according to different models in the EU and in the US. In the US, CCP clearing services are offered under a "Legally Separated but Operationally Co-mingled" (LSOC) client accounts model. The clearing member acts as an agent for its client. In the EU, the client-clearing member and clearing member-CCP relationships are both "principal to principal" relationships. EMIR requires that the length of the MPOR is set in accordance with the contract type, and imposes a minimum standard length of two and five days respectively for on-exchange and OTC contracts. Recently, ESMA consulted on a proposal (ESMA (2015), Review of Article 26 RTS 153/2013 on a one day MPOR with respect to client accounts) to also allow the use of a one day MPOR for margining client positions in exchange traded products, including derivatives, provided that the margin is held on a per client gross basis with the CCP, and frequent intraday margining is available. ESMA argues that a one day MPOR does not necessarily imply more risk for the CCP. With the proposal, ESMA seeks to obtain EU – US equivalence of CCP risk management practices in this respect. It should also be noted that under both the US and the EU regime, clients mutualise the other clients' losses if their common clearing member defaults. Finally, a simultaneous default of a clearing member and a big client will augment the stress incurred.

It is not straightforward to determine in advance which of the two systems (“gross client omnibus” with a one day MPOR versus “net client omnibus” with a two day MPOR) is the safer. Overall, more collateral is held on a two day margining basis, but this takes into account the collateral held both by the CCP and by the clearing member⁽¹⁾. The one day gross margining collateral is available at the level of the CCP, but of course, so are the positions to be covered. As individual client positions and margins are known and available at the level of the CCP, it becomes more likely that clients’ positions will be ported if a clearing member defaults. Under a net omnibus client model, porting will be more difficult, as clients of a defaulting clearing member will usually have to be ported to several clearing members⁽²⁾.

Finally, an individual client can also request to hold its own positions and collateral with the CCP, under a so-called individual client segregation model. In the European Union, CCPs are obliged to offer this model. In this case, the segregated margin will be used exclusively to cover the segregated positions of this particular individual client of the clearing member, and porting will normally occur if the client’s clearing member defaults.

1.3 Coverage of a clearing member default in “extreme but plausible” markets

It would not be prudent to expect that defaults will occur in “normal markets” only. Under EMIR, the current market fluctuations are to be covered by the defaulter’s collateral with a minimum 99 pct confidence interval⁽³⁾. To cover the CCP’s exposure to a clearing member default beyond this level, occurring in so-called “extreme but plausible” markets, clearing members contribute to the CCP’s prefunded *default fund*. This constitutes a “survivor pays” mechanism whereby clearing members mutualise losses so as to cover the CCP’s exposure to the defaulter.

We shall first consider the relevant elements that determine the size of the overall available default fund resources and coverage (point 1.3.1). Next, we look at the factors that determine an individual clearing member’s contribution to the default fund (point 1.3.2).

1.3.1 Elements of default fund sizing

The size of the default fund will be decisive for the coverage it achieves. This in turn depends partly on the scenarios used to determine “extreme but plausible” markets, and partly on how the stress loss risk for the CCP is distributed among the clearing members.

1.3.1.1 Scenarios of “extreme but plausible” market stress

Under EMIR, CCPs have to cover “extreme but plausible” price fluctuations or volatility⁽⁴⁾. Clearly, the scenarios used to design “extreme but plausible” stressed markets will influence the outcome of any coverage requirement. The choice of scenario influences the safety of using the CCP clearing services.

Under EMIR, both historical extreme markets and hypothetical scenarios of “extreme but plausible” markets have to be taken into account. The notion “extreme but plausible markets” is not very precise. Depending on the criterion used for a stressed market (e.g. 10YR OLO for fixed income, EURO/USD for exchange rates, EURO STOXX50 for equities), different time periods will be determined as exhibiting the greatest stress.

What counts as a “stressed period” also depends on the portfolio in question. In regard to large directional market movements, there is a difference in overall market stress (e.g. an event comparable to the Lehman default) and stress in a specific market (e.g. a Swiss franc “de-peg” event). It makes a difference whether stress risk is assumed to occur across all asset classes simultaneously, whereby the outcomes per asset class are subsequently summed. While this is

(1) Assuming that the CM sets margins for its clients as does the CCP for the clearing member, the increase of overall collateral held is roughly estimated to be 40 pct. higher under a two day margining regime.

(2) To enhance portability, some CCPs – such as Eurex Clearing AG – provide for overall client positions to be held temporarily – up to two days – directly with the CCP as a counterparty.

(3) Or, for OTC derivatives, with a minimum “99.5 pct.” confidence interval. Coverage is also determined by the MPOR, the lookback period and the probability distribution chosen to calculate this confidence interval.

(4) EMIR does not set a confidence interval here, as it does for initial margin coverage. For example, a 99.9 pct. confidence interval might not be “extreme but plausible”. See also Muphy, D. and Macdonald, D., Identifying historical episodes for central counterparty stress testing, *Journal of Financial Market Infrastructures*, 2016, 4(3), p 93.

clearly an extreme scenario, it might not be a plausible one. On the other hand, CCPs should shock product groups – such as equities, interest rates, credit – independently, as correlations among them found in normal market periods may disappear in stressed markets. Furthermore, for some portfolios volatility stress is the most relevant, as what is stress for an “outright” portfolio is not necessarily stress for a “spread” portfolio.

Box 2 – Use of multiple default funds by a CCP

The default fund model that the CCP uses is also relevant for sizing the default fund. A multi-product CCP that covers its stress exposure with a single default fund might be able to clear with less collateral overall. In practice, multi-product CCPs frequently do have multiple default funds per service provided (as does for instance LCH. Clearnet Ltd for its SwapClear and RepoClear services), as clearing members that only clear a specific class of products are not inclined to mutualise other services. Intermediary models also exist. Eurex Clearing AG, for instance, has separate default funds for the product classes it clears up to a specific threshold, up to which only clearing members clearing that product class mutualise the CCP's risk on the defaulting clearing member. Above that threshold, all clearing members contribute, via a (virtual) single default fund.

1.3.1.2 Default fund sizing and “cover2” measure

To size the default fund, the “cover2” principle⁽¹⁾ applies. This means that the fund resources should be sufficient to cover, in “extreme but plausible” markets, the stress loss risk that the CCP faces, i.e. the losses of the two biggest clearing member positions that are not covered by initial margins⁽²⁾.

How robust is a CCP in the face of extreme but plausible market stresses under “cover2”? The prudence of the cover2 requirement can be assessed according to the distribution of the potential stress losses that the CCP faces vis-à-vis its clearing members⁽³⁾. The size of the default fund produced by a cover2 requirement is highly dependent on how the risk for the CCP is distributed among its clearing members. For “stylised” distributions of stress risk exposure over a set number of clearing members, a “cover2” default fund would cover the summed stress exposure over all of its clearing members as follows: around ten pct. for uniformly distributed stress exposures, one third for an exponentially distributed exposure, and up to half for a concentrated, so-called “whale” distribution. For a more uniform distribution of stress exposure among clearing members, the cover2 has a lower value, implying a higher risk that the CCP may face losses beyond its default fund resources. According to a portfolio approach, an evenly distributed exposure risk would be considered safer, but the cover2 standard is by definition a weaker safety net in such a set-up. In practice, this is not a problem as the stress exposure that a CCP faces in reality is usually exponentially distributed over its clearing members, so that a few clearing members clear the bulk of the market. The cover2 measure functions very well in this context.

A related question is how to take into account the risk that clearing members default simultaneously. For example, for a given CCP, it could be more probable that its second to fourth clearing members default, while their summed stress risk is higher than the stress calculated via the cover2 approach. Also, the more clearing members a CCP has, the greater the likelihood that two members default simultaneously⁽⁴⁾. Again, this might have a big impact under a uniform stress loss distribution among the clearing members, but there may be little or no impact in the case of an exponentially distributed stress loss.

(1) At least in the European Union, this principle applies for a CCP established in the EU and for a third country CCP that provides services in the EU. Other comparable and pre-funded resources available to the CCP can also be taken into account for the “cover2”.

(2) The CCP's own contribution, its “skin in the game”, that is to be used prior to the default fund contributions of the surviving clearing members is disregarded here.

(3) This view is discussed more extensively in the paper by Murphy, D. and Nahai-Williamson, P., “Dear Prudence, won't you come out to play?”, Bank of England Financial Stability Paper no 30 of October 2014.

(4) The CPMI-IOSCO PFMI and EMIR provide only partial guidance in this respect, requiring clearing member group affiliates to be considered. Normally, a clearing member's risk to the CCP is to be considered on a stand-alone basis. Where clearing member group affiliates have off-setting positions, the requirement for the CCP to take the group level exposure into account for stress testing purposes clearly must not lead to a lower combined overall stress coverage than the sum of the stress coverages.

Cover2 is quite valuable as a rule of thumb. While further guidance on the distributional aspects of stress loss may not be necessary, the cover2 requirement cannot as such be compared across CCPs. It thus seems prudent that a CCP takes into account the distribution aspects of its potential stress loss risks on clearing members.

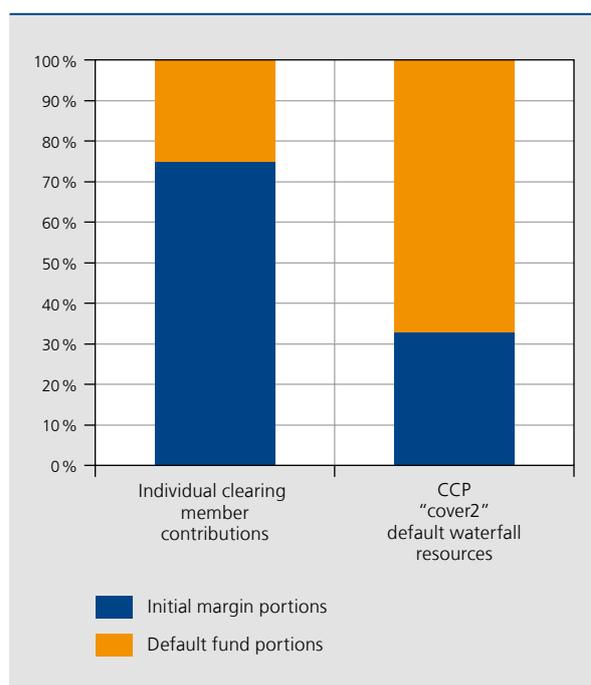
1.3.2 Clearing member contributions to the default fund

The clearing member may lose all or part of its prefunded default fund contribution in the event of the default of another clearing member. How much is at stake depends on how that contribution is determined for a given default fund size. The specific default fund replenishment modalities are also relevant.

1.3.2.1 Determination of a clearing member's contribution to the default fund

Usually, each clearing member contributes to the default fund in proportion to its outstanding positions. A clearing member thus contributes more the greater the risk that it brings to the CCP. According to this approach, each clearing member's default fund contribution will usually be smaller than the initial margin it provides to the CCP. Across all products cleared, 10 to 25 pct. of the initial margin amount provided is a good, very rough indication. Conversely, the total default fund size will usually be higher than the own initial margin contributions of even the "biggest" clearing member. Chart 2 shows a stylised representation.

CHART 2 INITIAL MARGIN AND DEFAULT FUND CONTRIBUTIONS OF AN INDIVIDUAL CLEARING MEMBER AND OVERALL CCP RESOURCES FOR STRESS LOSS COVERAGE (STYLISTED REPRESENTATION)



Sources: Estimates, derived from the CPMI-IOSCO quantitative disclosure framework data for CCP.

Some CCPs do not set the contribution of each clearing member in proportion to its positions. Instead, they set a fixed amount as default fund contribution that is equal for each clearing member and is unrelated to the fluctuating exposure the clearing member brings to the CCP. While this does not necessarily affect the overall default fund size, the initial margin/default fund contribution ratio may differ greatly among clearing members. This approach could hinder access to the CCP for small clearing members. On the other hand, if the default fund contribution is set high enough, there could be less need to make sudden calls for initial margin "add-ons" under stressed conditions, thus avoiding pro-cyclical effects and ensuring continuous coverage of the CCP's stress loss risk.

1.3.2.2 Default fund replenishment modalities

If the default fund contributions of the surviving clearing members are used, the default fund must be replenished at once – normally, on the next business day – to ensure the future continuous operation of the CCP. In that case, the clearing member also has the option of withdrawing as a clearing member. During the contractual cooling-off period that precedes this withdrawal, further loss sharing or replenishment requirements nonetheless still apply to both continuing and withdrawing clearing members. A precise understanding of these arrangements set out in the CCP's rulebook is relevant, as it also affects the adequacy and results of a CCP recovery process.

Box 3 – Re-use by the CCP of clearing member default fund contributions and initial margins

A CCP has to manage not only the credit risks it incurs but also its overall liquidity risks, especially in the event of a clearing member default. Here too, EMIR imposes a cover2 measure for liquidity stress. However, a clearing member facing a resilient CCP will not be directly affected by the CCP's liquidity management⁽¹⁾. A CCP has the right to use default fund contributions and initial margins where the purpose is to manage the default of a clearing member, so long as its rules make provision for that and it follows the EMIR requirements. Default fund contributions can, by definition, be used by the CCP to cover a clearing member default, while initial margins only cover the positions of the clearing member providing the margin, or of its clients. However, the use by the CCP of initial margins posted by a non-defaulting clearing member, via repo, is compatible with EMIR, insofar as it does not represent the final application of these margins to cover the loss due to the clearing member's default⁽²⁾. Hence, both initial margins and default fund contributions can be used for CCP liquidity management or settlement purposes. In this case too, the re-use by the CCP may have an impact on the adequacy and results of a CCP recovery process.

(1) For the impact of the CCP tool to obtain liquidity under recovery, see hereafter, point 2.2.2.

(2) See in this respect, CCP RTS Art. 44 and the ESMA FAQ on EMIR, CCP question 18 on Art. 45 (4) EMIR.

2. CCP recovery – Potential impact on clearing members

2.1 Introduction

In October 2014, the Committee on Payments and Market Infrastructures (CPMI) and the International Organisation of Securities Commissions (IOSCO) published a report on the recovery of FMIs⁽¹⁾. The aim of the report is to provide guidance supplementing the PFMI on how to draft comprehensive and effective recovery plans.

CCPs should prepare for potential threats to their viability and financial strength in order to maintain the continuity of their critical services in extreme financial conditions without requiring the intervention of the resolution authority. A recovery plan should identify the CCP's critical services and contain a list of triggers that will activate the implementation of the recovery tools, the objective being to recover from a set of extreme scenarios that could not be managed by relying only on the CCP prefunded financial resources. The recovery tools therefore supplement the "default waterfall" of the CCP when needed.

CPMI-IOSCO considers five categories of recovery tools: tools to allocate uncovered losses caused by a clearing member's default (cash calls and haircutting of claims); tools to address uncovered liquidity shortfalls (obtaining liquidity from clearing members or third parties); tools to replenish financial resources (cash calls and recapitalisation); tools to

(1) CPMI-IOSCO guidance of October 2014 on "Recovery of financial market infrastructures".

re-establish a matched book (forced allocation of contracts and contract termination); and tools to allocate losses not related to clearing member default (capital, recapitalisation, insurance and indemnity agreements).

2.2 CCP recovery tools

The following section provides an overview of CCP recovery tools with an impact on the clearing members of the CCP, along with a discussion of the tools' characteristics.

In very extreme circumstances, the default of a clearing member could give rise to losses exceeding the prefunded financial resources of a CCP, including the default fund. A viable recovery tool is to ask clearing members to provide additional contributions to the CCP, to share in the CCP's losses. This could be done via so-called cash calls or assessment powers (point 2.2.1), variation margin haircutting (point 2.2.2), or initial margin haircutting (point 2.2.3). A CCP might also obtain liquidity from clearing members under recovery (point 2.2.4), or allocate or tier-up contracts (points 2.2.5 and 2.2.6).

2.2.1 Cash calls or assessment powers

Usually, the CCP has the right to apply cash calls to direct clearing members, to the extent that the contributions are capped at a certain pre-agreed level. If contractually permitted ex ante, the CCP can ask for additional contributions that have no upper limit. Uncapped cash calls have the advantage for the CCP of comprehensively addressing the financial shortfall, but clearing members may not be able to measure the contribution in advance, creating a risk beyond their control. Clearing members may lose confidence in the CCP and decide to delay the cash payments, creating liquidity risk for the CCP. To enhance the reliability of the tool, CCPs could use participant's proprietary assets held at the CCP as collateral for the cash calls if that is legally permitted.

If the CCP has the contractual obligation to cap cash calls, it may be required to implement additional loss allocation tools to cover the remaining losses, creating an additional burden on clearing members.

To enable clearing members to control their potential exposure to the CCP, the CCP could link the size of cash calls to the default fund contributions. This would enable clearing members to control their potential exposure to the CCP by adjusting their behaviour. Clearing members would have an incentive to limit the risk that they bring to the CCP and could reserve sufficient capital on their books to cover this potential exposure.

2.2.2 Variation margin haircutting (VMHC)

As a CCP collects variation margin gains on a daily basis, VMHC may be a viable recovery tool. VMHC implies that the CCP applies pro rata haircuts to the gains made by clearing members with in-the-money positions, while continuing to receive in full the payments made by clearing members with out-of-the-money positions.

VMHC has the advantage of being a measurable recovery tool for clearing members, because the clearing member's loss is limited by the size of the variation margin gain. Clearing members can thus anticipate and model their exposure to some extent, provided that the terms and conditions of the tool are clearly stated ex ante in the FMI's rules.

VMHC is an effective recovery tool for the CCP. In principle, it is reliable and timely provided that the CCP collects all pay-ins on a daily basis before distributing the pay-outs. Nevertheless, there is a risk that clearing members expecting haircuts on potential future variation margin gains may not be willing to pay variation margins to the CCP on out-of-the-money positions, or may decide to leave the CCP.

It is important to note that VMHC has the same impact on clearing members as an insolvency proceeding but has the advantage of being quicker and less costly. The "No-Creditors-Worse-Off" (NCWO) principle derived from the banking recovery framework is thus respected.

In order to limit the impact on its clearing members, the CCP can decide to cap the haircut to an amount lower than the total amount of pay-outs owed by the CCP. However, this might require the CCP to supplement the tool with other loss allocation

tools, such as contract tear-up or additional cash calls, possibly creating disruption due to the highly stressed market conditions. The advantage of capping VMHC is that it to some extent contains the negative liquidity impact for clearing members.

Regardless of whether VMHC is capped, the tool provides the right incentives for clearing members to control the amount of risk they bring to the CCP, because the size of the loss is related to the risks of the clearing members' positions.

Nevertheless, VMHC does not specifically allocate the losses to the clearing members that are the best fit for that. In-the-money positions are not a perfect indication of a clearing member's ability to absorb losses. Moreover, VMHC could create pro-cyclical effects in times of financial distress and have an impact on the hedging arrangements of clearing members with other positions outside the CCP. Depending on the contract between the direct clearing members and their clients, VMHC could also have an impact on indirect clearing members which are less equipped to anticipate their potential exposures towards the CCP and to absorb the related losses.

2.2.3 Initial margin haircutting (IMHC)

Clearing members of a CCP are required to post initial margin covering their own obligations vis-à-vis the CCP in order to become members. If a clearing member defaults, the CCP can use the collateral posted by the defaulting clearing member to cover the exposure resulting from the default.

IMHC consists in writing down the initial margin provided by non-defaulting clearing members in order to cover the exposure caused by the default of another clearing member. The non-defaulting clearing members are then required to provide additional initial margin to restore the appropriate level of collateral and/or to reduce their exposure at the CCP. This tool is controversial because initial margin was originally meant to cover the exposure created by the clearing member itself, not that of other clearing members. This is stated in Article 45(4) of EMIR: 'A CCP shall not use the margins posted by non-defaulting members to cover the losses resulting from the default of another clearing member.'

Moreover, exposing clearing members to contamination risks in times of financial distress would create pro-cyclical effects. This may create disincentives for the clearing members to provide additional initial margin to the CCP, which would be left under-protected. Clearing members may even have to pass the impact of the tool on to their clients, creating a risk that is harder to anticipate and control.

An argument in favour of IMHC is that it constitutes an additional pool of prefunded financial assets for the CCP when the default waterfall proves to be insufficient. Some stakeholders argue that IMHC is fairer for the clearing members than VMHC because it would apply to all clearing members, as opposed to VMHC which is based on profit and is therefore less predictable.

If the tool is allowed under the forthcoming EU legislation, it should be rules-based and capped, in order to enable clearing members to calculate the necessary capital reserves in advance. As clearing members in CCPs, banks receive preferential treatment for capital charges covering direct exposures to CCPs. If IMHC is accepted as a recovery tool, this preferential treatment may need to be modified.

Some stakeholders argue that IMHC should be limited to cash collateral, which is not bankruptcy-remote in some jurisdictions. However, this could result in a situation where clearing members start posting initial margin exclusively in securities, creating a liquidity risk for the CCP.

2.2.4 Obtaining liquidity from clearing members

The CCP could ask all its clearing members to provide liquidity in times of distress, or limit the call for funds to those who are owed funds by the CCP. This recovery tool would enable clearing members to control the related risk and give them an incentive to monitor the CCP's liquidity risk management. Requesting liquidity from all clearing members would require pay-ins and would expose clearing members to obligations that they might not be able to control.

The tool could be implemented via collateralised or uncollateralised lending. Collateralised lending would be preferable from a clearing member's perspective.

2.2.5 Forced allocation of contracts

In order to cover its open position created by the defaulting clearing member, the CCP has to return to a matched book. This can be done by offsetting transactions or by auctioning off the unmatched positions. If the CCP fails to return to a matched book via voluntary means and the clearing service is considered critical for the functioning of the financial market, the CCP could force the allocation of unmatched positions to non-defaulting clearing members, naming its own price.

Forcing the allocation of contracts to non-defaulting clearing members implies a risk that clearing members may be saddled with unmanageable positions. This unpredictable forced allocation would create greater risks at a time of extreme stress and could oblige direct clearing members to pass the financial impact on to their clients. Some clearing members consider forced contract allocation to be a more disruptive tool than complete contract termination, available as a tool of last resort.

A less reliable but better way of re-establishing a matched book is via voluntary contract allocation.

2.2.6 Contract termination: tear-up

Contract termination involves permanently closing all the open contracts of a clearing service, or a subset of contracts at a certain price (e.g. based on the price for calculating the last variation margin), before the actual settlement date. In this way, the CCP can limit its losses and compensate those with claims based on its remaining financial resources. If the CCP has insufficient resources to pay the settlement price in full, the amounts due are written down pro rata among the clearing members concerned. Some regulators argue that complete termination is a winding-down tool rather than a recovery tool, since all the positions (both matched and unmatched) covered by the clearing service would be terminated. Complete termination is contrary to the recovery objective of critical service continuity.

The threat of contract termination as the recovery tool of last resort would provide the right incentives for all clearing members to participate voluntarily in an auction in order to avoid the implementation of the tool. Nevertheless, a full tear-up would result in significant market distortions. Direct and indirect clearing members hedging particular risks would see their hedged positions becoming unhedged. It could be difficult and costly for clearing members (in particular direct clearing members) to recreate their positions at other CCPs or via bilateral clearing. Moreover, settling the torn up contracts could create liquidity risks for the CCP clearing members.

A partial tear-up has the advantage of being relatively more measurable and controllable than a full contract termination, provided that the terms and conditions are well documented ex ante in the CCP's rules. A partial termination of contracts consists in closing out a subset of open contracts, enabling the CCP to limit the termination of contracts to the problematic ones that have a position opposite to that of the defaulting clearing member.

Nevertheless, a partial tear-up also alters the hedging arrangements of the direct and indirect clearing members. Clearing members subject to the termination are made worse off than the ones that are spared, which is not in line with the NCWO principle. In order to avoid this, the CCP could apply higher variation margin haircuts to the clearing members not exposed to the termination.

A viable method of avoiding the disruption caused by mandatory full or partial tear-up is to offer the clearing members the opportunity to voluntarily designate the contracts for tear-up. The clearing members would be able to stop a particular contract that may have become unattractive.

2.2.7 Non default-related losses – remaining capital and recapitalisation

CCPs are also exposed to general business, operational, custody and investment risks. In order to protect themselves against losses, CCPs are required to dedicate a portion of their capital to cover these risks. Nevertheless, the dedicated portion of the CCP's capital could still prove insufficient to protect the CCP, and the CCP, after having borne the first loss, may allocate the remaining losses to its clearing members.

Clearing members could thus be exposed to non default-related losses even if those losses are mainly due to poor risk management methods at the CCP. For instance, UK CCPs use loss allocation tools for losses caused by an investment

counterparty default. A first tranche is allocated to the CCP itself and the rest is distributed among the clearing members in proportion to their margins.

Allocating a subset of non default-related losses to clearing members distributes the burden between the CCP and its clearing members. It provides the right incentives to clearing members to monitor the risk management activities of the CCP. Nevertheless, clearing members are exposed to uncapped losses that they are unable to control.

3. Recovery tools of the three major CCPs for the Belgian market

Table 3 provides an overview of the recovery tools of LCH.Clearnet Ltd, LCH.Clearnet SA and Eurex Clearing AG, and indicates the potential impact on Belgian clearing members if the respective CCPs go into recovery.

TABLE 3 CCP RECOVERY TOOLS
(situation as per end Q1 2016)

		LCH.Clearnet SA		LCH.Clearnet Ltd		Eurex Clearing AG	
		CCP default waterfall ⁽¹⁾					
		CDSClear	Cash & Derivatives, Fixed Income and €GCPlus	ForexClear and SwapClear	Commodities, Listed Rates, Equities and RepoClear	All clearing services	
Capped assessments	RECOVERY TOOLS	100 % of default fund contribution ⁽²⁾	100 % of default fund contribution ⁽³⁾	100 % of default fund contribution ⁽⁴⁾		200 % of default fund contribution ⁽⁵⁾	
VMHC		YES	NO	YES	NO	NO	
Loss distribution ⁽⁶⁾		NO	YES	NO	YES	NO	
IMHC		NO		NO		NO	
Voluntary contributions ⁽⁷⁾		YES		YES		NO	
Obtaining liquidity from clearing members		NO		NO		NO	
Forced allocations of contracts		NO		NO		NO	
Contract termination: tear-up		YES		YES		YES	
Remaining capital and recapitalisation		Shareholders	NO ⁽⁸⁾		NO ⁽⁸⁾		YES ⁽⁹⁾
		Clearing members	NO		YES ⁽¹⁰⁾		NO

Source: CCP website and rulebook.

(1) As described in the coloured part of Chart 1

(2) Max. 100 % of the default fund contribution over a period of 25 days independently of the number of default events.

(3) Max. 100 % of the default fund contribution per default event, capped at max. 300 % of the default fund contribution within a specified period of six months in case of multiple defaults.

(4) Max. 100 % of the default fund contribution per default event, capped at max. 300 % of the default fund contribution within a specified period of six months in case of multiple defaults.

(5) Max. 200 % of the default fund contribution within a capped period of 20 business days, extendable to 3 months independently of the number of default events.

(6) Loss distribution is an additional contribution from the non-defaulting clearing members capped at an amount of max. 100 % of the default fund contribution.

(7) LCH.Clearnet SA and LCH.Clearnet Ltd can ask for voluntary contributions from their clearing members as the penultimate recovery tool, to re-establish a matched book before tearing-up contracts.

(8) It is at the discretion of the shareholders to recapitalise the CCP. If there is no recapitalisation, the remaining capital of the CCP will be depleted.

(9) Eurex Clearing AG's last two lines of defence are a parental guarantee from Deutsche Börse and the CCP's remaining capital. Clearing members will not be affected by these capital tools. This is based on public information available on the Eurex Clearing AG official website <http://www.eurexclearing.com/clearing-en/risk-management/lines-of-defense>.

(10) LCH.Clearnet Ltd's rules allow it to allocate solvency-threatening losses caused by investment losses to its clearing members, after having born an initial portion of the loss first.

For clearing members of LCH.Clearnet Ltd, LCH.Clearnet SA and Eurex Clearing AG, the initial margin is unaffected by recovery and there is no risk of being exposed to a forced allocation of contracts. Clearing members could be asked to make additional capped payments if the default fund proves to be insufficient.

Clearing members of LCH.Clearnet Ltd and LCH.Clearnet SA could be exposed to VMHC depending on the service they use and to contract tear-up. In order to avoid a contract tear-up, clearing members of both CCPs have a strong incentive to provide enough voluntary contributions to the CCP in recovery.

Clearing members of LCH.Clearnet Ltd are exposed to investment losses if the maximum amount of losses allocated to the CCP itself is exceeded.

Finally, clearing members of Eurex Clearing AG will be affected by cash calls up to twice their default fund contribution and by contract tear-up. Thereafter, Deutsche Börse will provide a guarantee and the CCP's remaining capital will be exhausted.

Conclusion

Participation in a CCP involves some risks, both in the face of a resilient CCP and when the CCP recovery regime becomes active.

A clearing member facing a resilient CCP may be confronted with sudden margin calls that have a pro-cyclical effect overall and that make its liquidity provisioning harder. Moreover, as contributors to the CCP default fund, they may share part of the loss if a clearing member defaults, and their prefunded resources may be lost. Clients of a clearing member risk non-portability of their positions if their clearing member defaults.

If the default fund is insufficient to cover the losses to which the CCP is exposed in the event of a clearing member default, the CCP will have to implement its recovery tools and require the clearing members to provide additional contributions by way of cash calls, variation margins or loss distributions. In addition, if the CCP is unable to re-establish a matched book via an auction, it could decide to terminate all contracts, or a subset of the open contracts covered by a clearing service, at a certain price before the actual settlement date. This will have an impact on clearing members of a CCP in recovery.

Finally, it is relevant to note that while there is little variation in the default waterfall structure of the three major EU CCPs, there are significant differences in the recovery tools with respect to the maximum amount of the assessment powers, the application of VMHC, the possibility of requests for additional (voluntary) contributions and the allocation of non default-related losses to clearing members.

Bibliography

- Committee on Payments and Settlements System – International Organisation of Securities Commissions (2012), “Principles for financial market infrastructures”.
- Committee on Payments and Market Infrastructures – International Organisation of Securities Commissions (2014), “Recovery of financial market infrastructures”.
- Carter, L., & Garner, M. (2015), “Skin in the Game – Central Counterparty Risk Controls and Incentives”.
- Elliot, David (2013), “Central counterparty loss allocation rules”, Bank of England Financial Stability Paper no 20.
- European Association of CCP Clearing Houses (2014), “An effective recovery and resolution regime for CCP”.
- European Association of CCP Clearing Houses (2015), “An effective recovery and resolution regime for CCP. Additional subjects to be considered”.
- European Association of CCP Clearing Houses (2015), “Best practices for CCP stress tests”.
- European Parliament and Council, “Regulation no 648/2012 of 4 July 2012 on OTC derivatives, central counterparties and trade repositories”, published in the Official Journal of the EU of 27 July 2012.
- ESMA, (2015) Consultation paper “Review of Article 26 of RTS 153/2013 on a one day MPOR with respect to client accounts.
- ESMA (2016), Final report on “Possible systemic risk and cost implications of interoperability arrangements”.
- ESRB, Report on the efficiency of margin requirements to limit pro-cyclicality of 28 July 2015.
- Financial Stability Board (2014), “Key attributes of effective resolution regimes for financial institutions”.
- Gibson, M. (2013), “Recovery and Resolution of Central Counterparties”.
- ISDA (2013), “CCP Loss Allocation at the End of the Waterfall”.
- ISDA (2015), “CCP Default Management, Recovery and Continuity: A Proposed Recovery Framework”.
- LCH.Clearnet Group (n.d.), “CCP risk management, recovery and resolution”, white paper.
- LCH.Clearnet Group (2016), “Risk Management Overview”. Retrieved from <http://www.lchclearnet.com/risk-collateral-management/risk-management-overview/ccp-risk-management-recovery-resolution>
- LCH.Clearnet Ltd (2016), “LCHClearnet Ltd Rulebook”. Retrieved from <http://www.lch.com/rules-regulations/rulebooks/ltd>
- LCH.Clearnet SA (2016), “LCHClearnet SA Rulebooks”. Retrieved from <http://www.lch.com/rules-regulations/rulebooks/sa>
- Eurex Clearing AG (n.d.), “Lines of defense”. Retrieved from <http://www.eurexclearing.com/clearing-en/sk-management/lines-of-defense>
- Murphy, D. and Nahai-Williamson, P. (2014), “Dear Prudence, won’t you come out to play?”, Bank of England Financial Stability Paper no 30.

Muphy, D. and Macdonald, D. (2016), Identifying historical episodes for central counterparty stress testing, Journal of Financial Market Infrastructures, 2016.

Murphy, D., Vasios, M. and Vause, N. (2014), "An investigation into the pro-cyclicality of risk-based initial margin models", Bank of England Financial Stability Paper no 29.