

ESRB REPORT TO THE EUROPEAN COMMISSION ON THE SYSTEMIC RISK IMPLICATIONS OF CCP INTEROPERABILITY ARRANGEMENTS¹

Executive summary

Article 2 of the European Market Infrastructure Regulation (EMIR)² defines an interoperability arrangement as “*an arrangement between two or more CCPs that involves a cross-system execution of transactions*”. The definition in EMIR corresponds to what is referred to as “peer-to-peer links” in the CPSS-IOSCO Principles for Financial Market Infrastructures (PFMIs) and other international publications.

Central counterparty (CCP) interoperability arrangements are governed by EMIR, including a number of provisions in Title V of EMIR, which determine their scope (transferable securities and money market instruments), approval process and risk management features, as well as capital requirements (Commission Delegated Regulation No 152/2013 of 19 December 2012). The regulatory framework is complemented by the guidelines and recommendations that the European Securities and Markets Authority (ESMA) issued in 2013 in consultation with the European System of Central Banks (ESCB). National competent authorities (NCAs) have to follow ESMA guidelines on a “comply or explain” basis when approving and/or supervising such arrangements.

Article 85(3) of EMIR, inter alia, tasks ESMA with delivering a report on “*the extension of the scope of interoperability arrangements under Title V to transactions in classes of financial instruments other than transferable securities and money-market instruments*”. Article 85(4) then states: “*The Commission shall, in cooperation with the Member States and ESMA, and after requesting the assessment of the ESRB, draw up an annual report assessing any possible systemic risk and cost implications of interoperability arrangements. The report shall focus at least on the number and complexity of such arrangements, and the adequacy of risk-management systems and models. The Commission shall submit the report to the European Parliament and the Council, together with any appropriate proposals. The ESRB shall provide the Commission with its assessment of any possible systemic risk implications of interoperability arrangements.*”

Against this background, the European Commission has asked the ESRB to provide its assessment of interoperability arrangements by 31 January 2016. This report constitutes

¹ This report benefits from input received at the ESRB Workshop on CCP Interoperability Arrangements, which took place in Frankfurt am Main, Germany, on 2 November 2015.

² Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

both the ESRB assessment required by Article 85(4) of EMIR and the ESRB's response to the Commission's request.

The report begins by recalling the fundamental mechanics of central clearing, before going on to provide a description of the taxonomy of cross-CCP arrangements. The descriptive part of the report is complemented by a synthetic illustration of the regulatory framework currently underpinning CCP interoperability arrangements in the EU, and a description of the current landscape in the EU in terms of such arrangements. The description is based on a survey carried out in cooperation with the relevant NCAs, which shows that five interoperability arrangements are currently in operation in the EU, handling cash products, repos and, in one case, exchange-traded derivatives (ETDs). In terms of the basic functioning of those links, there are several similarities, although there are also differences. This coexistence of similarities and differences may be regarded as a result of the principle/outcome-based approach embedded in the regulatory framework for interoperability arrangements under EMIR.

The ESRB's assessment of the systemic risk implications of the EU's interoperability arrangements is provided in Section 5 of the report. In preparing its assessment, the ESRB has considered both the existing literature on CCP interoperability arrangements and available information on the links that are currently in operation in the EU. In this respect, it should be emphasised that this ESRB report does not constitute a reassessment of the links that have already been approved in the EU in accordance with the relevant legal procedure under EMIR. Instead, it aims to provide a first general assessment of the benefits and risks that such arrangements can create in the EU in terms of financial stability, focusing on the current situation (i.e. bilateral links, mainly within the EU). Further analysis may be needed for multilateral links and links developed under the European Commission's equivalence decision.

In the ESRB's opinion, CCP interoperability arrangements can have implications for financial stability in two different ways. On the one hand, such arrangements can help to contain systemic risks in a situation where a number of different CCPs clear the same financial instruments, insofar as they allow intermediaries to hold their position with one CCP, instead of "fragmenting" it across different CCPs. This increases netting possibilities, helps to limit demand for eligible collateral, and avoids situations where the default of a clearing member triggers parallel default procedures (for positions handled by interoperable CCPs, obviously). On the other hand, however, CCP interoperability arrangements can have systemic risk implications, since the establishment of interoperable links introduces a significant element of complexity into the overall risk management system and adds a channel for direct contagion between two or more CCPs. For these reasons, inter-CCP exposures must be (i) properly monitored (including through an appropriate exchange of information between the interoperable CCPs and relevant NCAs), (ii) addressed by means of a sound risk management framework and (iii) backed by adequate financial resources. Furthermore, this

additional complexity appears to be directly proportionate to the complexity of the products which might be cleared through the link, leading to an even more cautious approach when it comes to over-the-counter (OTC) derivatives.

The most significant implications of interoperability arrangements in terms of systemic risk materialise in the event of an interoperable CCP defaulting. With this in mind, this report points to the need to carefully develop recovery and resolution procedures for CCPs in order to contain the potential contagion which could stem from the default of an interoperable CCP.

The report identifies a number of policy issues which, in the ESRB's opinion, merit further consideration from a macro-prudential point of view. In particular, the ESRB notes that the existing regulatory framework provides the NCAs with some flexibility in their interpretation of the EMIR Level 1 text and the ESMA guidelines. So far, this has not resulted in inconsistent national frameworks. However, considering the possibility of the further expansion of interoperability arrangements, there could be scope for more granular and prescriptive regulation. This would provide clarity for supervisors and regulators and ensure harmonised implementation in the future. When it comes to recovery and resolution procedures for CCPs, the role of interoperability arrangements in a CCP default waterfall could be clarified to specify the contingent commitments of linked CCPs in the event that pre-funded financial resources are depleted.

Furthermore, as far as derivatives are concerned, the ESRB would like further analysis to be undertaken on the specificities and complexities relating to potential new derivatives links, in particular the complexities relating to potential OTC derivatives links. This analysis should provide a basis for assessing the extent to which the current framework sufficiently covers the risks that are specific to derivatives links, and where adjustments may be necessary. The ESRB stands ready to provide the macro-prudential contribution to such an analysis.

Finally, the role of the ESRB could also be revisited. Given the systemic relevance of CCP interoperability arrangements, the ESRB could be given a consultative role in the decision-making process for any future extension of the scope of interoperability and the development of related guidelines and regulations.

Article 85 of EMIR refers to an *annual* report by the Commission to the European Parliament and the Council. The ESRB is ready to provide future assessments of any possible systemic risk implications of interoperability arrangements.

1. Introduction

Article 2 of EMIR defines an interoperability arrangement as “*an arrangement between two or more CCPs that involves a cross-system execution of transactions*”. Under Article 85(4) of EMIR, the European Commission is required, in cooperation with the Member States and ESMA, and after requesting an assessment by the ESRB, to draw up an annual report assessing any possible systemic risk and cost implications of interoperability arrangements. Consequently, the ESRB is required to provide the Commission with its assessment of any possible systemic risk implications of interoperability arrangements. The Commission is to submit that annual report to the European Parliament and the Council, together with any relevant proposals.

This report constitutes the ESRB's first assessment as required by Article 85(4) of EMIR.

The role of CCPs in the financial system

CCPs play a key role in the financial system by managing and structuring a complex web of counterparty risk relationships. They do this, in essence, by (i) interposing themselves between the parties to contracts traded in one or more financial markets (regulated or OTC) and (ii) protecting themselves against defaults by their members by collecting adequate collateral from both the buyer and the seller, and implementing loss-sharing arrangements (to be used in extreme cases, where individual margins prove to be insufficient).

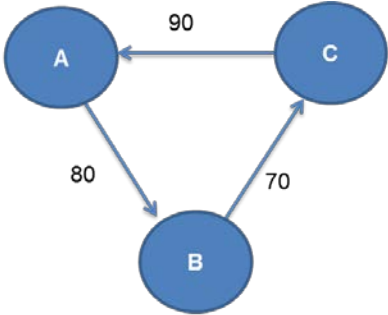
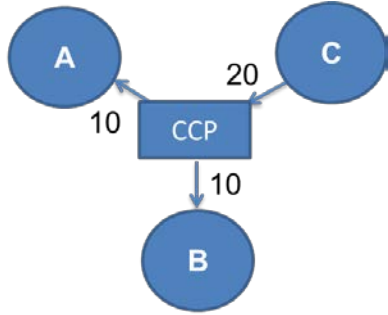
In legal terms, the interposition of the CCP means that the original contract is replaced by two contracts (novation):³ one between the CCP and the buyer, and another between the CCP and the seller. This protects the two parties against a default by the original counterparty in the trade, and reduces counterparty risk. The reason for this is that the probability of default is likely to be lower for a CCP than for a risk-taking intermediary, given the constantly balanced and collateralised positions of a CCP, and the fact that a CCP does not engage in any risky activities that are not strictly related to clearing services.

A participant in a CCP enjoys reduced risks compared with bilateral clearing to the extent that it benefits from multilateral netting, adequate collateralisation and mutualisation of losses. The CCP nets participants' obligations (long and short positions) for single products, determining a single multilateral balance per product/participant regardless of the identity of the counterparty before novation. Where products are significantly correlated, CCPs can determine participants' margins across products (portfolio margining), allowing them to offset risk by holding positions on correlated products.

³ A CCP can also interpose itself through an analogous legally binding agreement or an open-offer system. In an open-offer system, a CCP is automatically and immediately interposed in a transaction at the moment the buyer and seller agree on the terms (CPSS-IOSCO, 2012).

In bilateral clearing, netting occurs only for transactions cleared with the same counterparty (see Chart 1a) or where portfolio compression is provided by an external service provider (see Article 31 of the Markets in Financial Instruments Regulation (MiFIR)).⁴ If the multilateral netting results in reduced exposure for the participant, as shown in Chart 1b, this will reduce the amount of collateral the participant has to provide to the CCP in the form of an initial margin and other financial resources covering current and potential future credit exposures. However, while the netting of positions in bilateral clearing often covers several asset classes owing to comprehensive master agreements, moving only a subset of these asset classes to CCP clearing could split up these netting sets. Such a partial move from bilateral to central clearing could, in some cases, result in an increase in the amount of collateral that needs to be provided.

In order for risk reduction benefits to be enjoyed, the CCP must manage its risk effectively and have adequate financial resources available.

Chart 1a: Transactions without a CCP	Chart 1b: CCP introduces multilateral netting
 Aggregate exposure: 240	 Aggregate exposure: 40
<i>Note: With bilateral clearing, the parties cannot net trades with different counterparties.</i>	<i>Note: By interposing itself as the counterparty for all transactions, a CCP allows the netting of positions vis-à-vis all other clearing members, resulting in increased netting efficiency.</i>

Drivers of interoperability arrangements

The originally national orientation of financial markets in the EU has resulted in the coexistence of a variety of CCPs, some of which offer central clearing services for the same asset classes, although not the same specific financial instruments.⁵ The intention of the Markets in Financial Instruments Directive (MiFID),⁶ which entered into force in 2007, was to

⁴ Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012.

⁵ As of 30 October 2015, 16 European CCPs were authorised to offer services and activities pursuant to EMIR: https://www.esma.europa.eu/sites/default/files/library/ccps_authoised_under_emir.pdf

⁶ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council, and repealing Council Directive 93/22/EEC.

lower trading costs for equities by introducing competition at the trading level, with incumbent exchanges being challenged by newly created trading venues – multilateral trading facilities (MTFs). This contributed to the establishment of new CCPs, since these new marketplaces demanded the benefits provided by central clearing. A decline in direct trading and clearing fees has been observed in recent years, while some market liquidity fragmentation across a variety of trading venues also has been observed. As a consequence, in some cases the same financial instruments are now traded at different trading venues and cleared in different CCPs. Fragmentation within individual markets or across products can reasonably be regarded as resulting in suboptimal netting efficiency, with the latter decreasing the netting benefits derived from portfolio margining.

There is less fragmentation with derivatives exchanges than with cash markets. The well-established marketplaces for derivatives tend to establish natural monopolies owing to high investment costs and the fact that few derivatives are traded at more than one trading venue. Nevertheless, there is a large market for OTC derivatives, and part of this will move to CCPs as a result of the G20 reform agenda.

The fragmented clearing industry has, in some cases, led to demand for interoperability arrangements, driven by clearing members wishing to net positions in securities traded at different trading venues, which would otherwise be cleared through different CCPs. Interoperability arrangements allow participants in one CCP to centrally clear trades with members of the interoperable CCP and benefit from multilateral netting, without being a member of both CCPs. Participants can thus choose from a variety of CCPs offering different services. A trade cleared through an interoperable link will be novated by replacing the original contract with three separate contracts: one between the first CCP and the buyer, another between the other CCP and the seller, and a third between the two interoperable CCPs. Moreover, a CCP can have interoperability arrangements with more than one other CCP, which further complicates the network of exposures.

The pan-European TARGET2-Securities platform for securities settlement in central bank money is expected to facilitate existing and future interoperability arrangements within the EU insofar as it facilitates the mobilisation of collateral and the settlement of cross-border and cross-system transactions.

2. Types of cross-CCP arrangements

CCPs may establish various types of link with each other, but only “peer-to-peer links” are considered interoperability arrangements under EMIR and are covered by the regulation. Peer-to-peer links allow CCPs to operate on an equal footing. Risk management between the CCPs is based on a bilaterally approved framework which is different from that applied to a normal participant, and ensures coverage of cross-CCP exposures for all participating CCPs. Under the existing interoperability arrangements in the EU, CCPs exchange margins and other financial resources on a reciprocal basis, based on mutually agreed margining

models. The linked CCPs incur current and potential future exposure to each other as a result of the novated (net) positions between CCPs. CCPs may agree to use exactly the same margining methodology or to apply different margining models. In the case of different margining models, this can influence incentives for participants to move their participation to another linked CCP, although other factors also contribute to participants' choice of CCP (clearing fees, extent of netting opportunities provided, range of services, etc.). Importantly, EMIR establishes a set of minimum requirements for risk management parameters in order to avoid (or at least significantly limit the possibility of) competition occurring between CCPs on risk grounds.

As demanded by EMIR, this report will focus on interoperability arrangements and does not contain an assessment of the other cross-CCP arrangements described in Box 1, or their benefits and risks from a systemic risk perspective.

Box 1: Cross-CCP arrangements that are not considered to be interoperability arrangements

Participant links allow a CCP (the participant CCP) to become a member of another CCP (the host CCP) subject to the host CCP's normal participant rules. In this situation, some harmonisation of risk management and operational requirements will be necessary in order to effectively manage the risks of trades cleared across the participant link. In contrast to interoperability arrangements, linked CCPs are not on an equal footing when it comes to cross-CCP risk management in a participant link, as the participant CCP does not receive any financial resources to cover cross-CCP exposures. Since the participant CCP posts margin, but does not collect margin from the host CCP, the participant CCP should hold additional financial resources to protect itself against a default by the host CCP. Like interoperability arrangements, participant links enable clearing members to join only one of the linked CCPs and allow multilateral netting across commonly cleared products and participants of both CCPs.

Mutual offset arrangements allow participants to establish a derivatives position in one CCP and close it in another. This allows a participant to trade the same position across markets, for instance across time zones. Inter-CCP exposures are thereby created, since the CCPs must offset each transferred position with an opposing position between themselves. A mutual offset arrangement is currently in place between Chicago Mercantile Exchange Inc. (CME) and Singapore Exchange Limited (SGX), covering futures contracts.

Cross-margining agreements are arrangements between two or more CCPs whereby they regard positions and supporting collateral in their respective organisations as a common portfolio for participants that are clearing members of all CCPs. Although cross-margining agreements are not considered to be interoperability links, they allow for the joint margining of transactions involving designated highly correlated products. These could include, for

example, a short futures position and a long call-option position that reference the same underlying financial instrument. If both positions were held in the same CCP, the CCP would typically acknowledge this reduced risk by giving a proportionate reduction to the initial margin requirements; cross-margining extends this practice to contracts held across different CCPs.

Clearing members are able to net exposures with offsetting risk characteristics across CCPs, but have to be members of all participating CCPs to benefit from this netting. To achieve this, the CCPs share information on participants' positions and work together to calculate discounted initial margin requirements for each cross-margined portfolio. If a cross-margined participant defaults, which would probably result in gains for one CCP and losses for the other, the two CCPs share the gains and losses on that participant's cross-margined positions and the participant's collateral. This creates exposure between the CCPs, because each CCP faces the risk of the other CCP defaulting at the same time as a cross-margined participant. In this situation, if the surviving CCP suffered losses on the cross-margined positions, it could potentially have insufficient collateral to cover them.

Cross-margining arrangements are common in the United States. US CCPs with cross-margining arrangements include CME, the Fixed Income Clearing Corporation, the Options Clearing Corporation, New York Portfolio Clearing and ICE Clear US. These arrangements cover futures, options and fixed income products. An international cross-margining arrangement was set up for short-term interest rate contracts between CME Clearing and LCH.Clearnet Ltd in 2000, and was terminated in 2010 on account of increased maintenance costs. At present, EMIR does not directly cover CCP cross-margining.⁷ However, ESMA Q&A 9 strongly implies that it is not possible under EMIR⁸.

3. The regulatory framework for CCP interoperability arrangements under EMIR

Before EMIR entered into force, there was no specific legislation on CCP interoperability in the EU. A European Code of Conduct for Clearing and Settlement was adopted on 7 November 2006, establishing a voluntary framework governing the creation of links between CCPs for the clearing of cash equities, in order to further integrate the European post-trading landscape. Further details of the risk management of such links were set out in the Access and Interoperability Guidelines of 28 June 2007 (which were issued by various associations of trading and post-trading operators). Dutch, Swiss and UK CCP regulators then produced specific regulatory guidance on CCP interoperability in 2010.

Interoperability is covered under EMIR Level 1 (Title V). In addition, pursuant to Article 54(4) of EMIR, ESMA published five guidelines and recommendations in June 2013, developed in

⁷ For details of the provisions that would be relevant in a cross-margining set-up, please refer to the relevant question in ESMA's questions and answers on the implementation of EMIR.

⁸ https://www.esma.europa.eu/sites/default/files/library/2015/11/2015-1485_qa_xiv_on_emir_implementation_october_2015.pdf

consultation with the members of the ESCB; the guidelines are addressed to NCAs and seek to establish consistent, efficient and effective assessments of interoperability arrangements. The question of interoperability is also addressed in ESMA's EMIR Q&A and mentioned in the context of the access provisions in Articles 35 and 36 of MiFIR. Lastly, the Bank of England introduced additional guidance to incorporate the ESMA guidelines into its supervisory approach to assess interoperability arrangements.

Title V of EMIR on interoperability comprises Articles 51 to 54. The approval of interoperability arrangements by the competent authorities is covered by Article 54, which also stipulates that the relevant colleges of supervisors must adopt joint opinions. Article 52 sets out specific risk management rules for interoperability arrangements. These rules seek to ensure that an interoperability arrangement does not expose the relevant CCPs to additional risks that are not appropriately mitigated and that any risk to which a CCP is exposed that can affect the safety of the other interoperable CCPs or the arrangement itself is adequately assessed, monitored and mitigated. Interoperable CCPs must exchange margins but must not, to avoid the risk of contagion, contribute to each other's default funds (Article 53, in combination with Article 42 on default funds and Guideline 3(b)(v)). Article 53(5) states that collateral that a CCP A has received from a linked CCP B must be readily returned if the CCP A defaults.

Article 1 of EMIR on the regulation's subject matter and scope states that the articles on interoperability in Title V *"shall apply only to transferable securities and money-market instruments"*. This is further underlined by recital 73 of EMIR, which states that *"given the additional complexities involved in an interoperability arrangement between CCPs clearing OTC derivative contracts, it is appropriate at this stage to restrict the scope of interoperability arrangements to transferable securities and money-market instruments"*.

The interpretation provided by ESMA in its June 2013 final report on guidelines and recommendations on interoperability is that interoperability is not specifically prohibited for ETDs and OTC derivatives, despite not being covered by EMIR.⁹ Thus, CCPs and relevant NCAs are expected to apply the ESMA guidelines to existing or planned derivative links. There is currently one such link – between LCH.Clearnet Ltd and the Norwegian branch of SIX x-clear AG for index and single Norwegian stock futures and options.

⁹ Paragraph 14 of Section III of the ESMA report states: *"While interoperability in respect of derivative instruments (including OTC derivative instruments) is permitted under EMIR (the provisions of Title V simply do not apply to such arrangements) it is expected that NCAs will apply ESMA's Guidelines and Recommendations to interoperability arrangements for products other than transferable securities or money-market instruments and expected that CCPs will have regard to the provisions in Title V of EMIR when structuring such interoperability arrangements. However, given the mandate for these Guidelines and Recommendations comes from Title V of EMIR which pertains only to transferable securities or money-market instruments, ESMA considers it inappropriate to incorporate in these Guidelines and Recommendations requirements that are specific to interoperability arrangements for derivative products."*

EMIR requires ESMA to submit a report to the Commission on whether an extension of the scope to cover other financial instruments would be appropriate. Consequently, ESMA published a report in July 2015 on extending the scope of the EMIR requirements regarding interoperability arrangements to cover transactions in classes of financial instrument other than transferable securities and money market instruments. In that report, ESMA proposed extending the scope of the EMIR requirements regarding interoperability to cover ETDs, but not OTC derivatives. In ESMA's opinion, the *"costs for extending the EMIR provisions on interoperability ... are relatively small"*, while *"the benefit in terms of certainty on the right of establishment of an interoperability arrangement for derivatives will be undisputed"*. In addition, ESMA provides two main justifications for restricting the extension of that scope to ETDs at this stage. First, ESMA does not wish to incentivise the establishment of OTC derivative links at the current juncture, owing to the complexities with regard to the risk management of such links. Second, it believes that it would not be prudent to include OTC derivative links within the scope of EMIR before the potentially uncertain effects of the clearing obligation have been assessed.

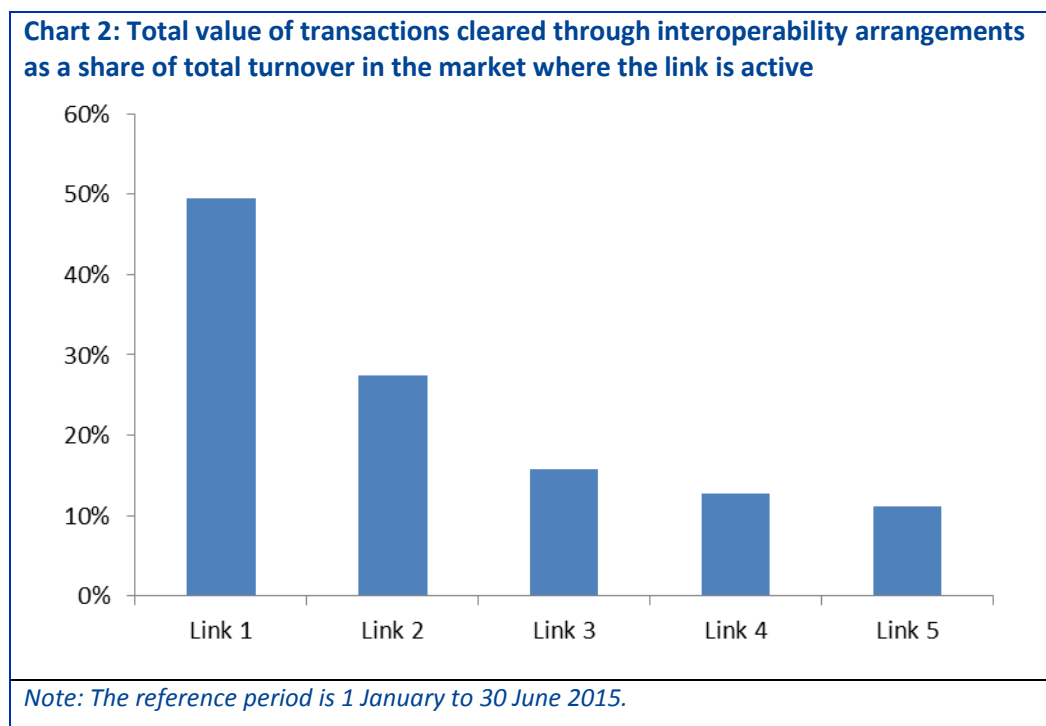
Articles 35 and 36 of MiFIR give CCPs access rights to trading venues and vice versa. These access rights can potentially lead to voluntary interoperability, but the competent authority of the CCP or that of the trading venue must, according to MiFIR, grant access only where such access (i) would not, in the case of ETDs, require an interoperability arrangement and (ii) would not threaten the smooth and orderly functioning of the markets, particularly owing to liquidity fragmentation, or would not adversely affect systemic risk. ETDs may be temporarily excluded from Articles 35 and 36 of MiFIR for up to 30 months pursuant to Article 52(12) of MiFIR. The access rights in MiFIR do not cover OTC derivatives, as the relevant access rights are already laid down in Articles 7 and 8 of EMIR (where it is stated that *"access of a CCP to a trading venue shall only be granted where such access would not require interoperability"*).

4. Current interoperability arrangements in the EU

There are five interoperable links in the EU, linking four authorised EU CCPs, a Swiss CCP and its Norwegian branch. These interoperability arrangements typically cover one instrument class per link, with cash equities being the most common instrument. One link covers also equity derivatives, and another link covers government bonds only (cash and repo). Transactions cleared through interoperability arrangements account for a significant share of total turnover in the markets where the links are active, as Chart 2 shows. The amounts cleared through individual links in the first half of 2015 ranged from the low billions to the low trillions Euro. Table 1 provides an overview of the characteristics of EU links, based on surveys completed by the respective NCAs.

There appears to be no clear correlation between the number of EU CCPs that are authorised to clear an instrument class and an existing interoperability arrangement being in place. For instrument classes where an interoperability arrangement is in place, the number

of EU CCPs that are authorised to clear that instrument class ranges from two to ten. Annex 2 shows the number of CCPs that are authorised or recognised to clear asset classes in the EU.



There are considerable similarities between the interoperable links in the EU. All links are bilateral, and all of the CCPs involved exchange initial and variation margins as a first way of mitigating inter-CCP counterparty risk. The initial and variation methods used by those CCPs to calculate the margins they require from linked CCPs are the same as those applied to their own clearing members. All interoperable CCPs may be placed in default by their linked CCPs on the basis of non-performance of contractual obligations, after appropriate consultation and information-sharing with the relevant NCAs. In this respect, it should be noted that the forthcoming legislation on the recovery and resolution of CCPs could also have implications for interoperability arrangements.

There are also differences between links. As regards risk management, some CCPs apply the same concentration and large exposure margins to linked CCPs that they apply to clearing members, but in one interoperable link such margins are not exchanged between the interoperable CCPs. Similarly, one interoperable link does not provide the calling of intraday margins between the linked CCPs but in that link the CCPs routinely exchange an additional margin that is calculated to cover forecasted intraday exposures; in other links an additional margin is called during periods of expected market volatility.

Table 1: Overview of existing interoperability arrangements

Establishment of links	Between 2003 and 2012
EMIR approval date in reauthorisation process (all links)	2014
Number of instruments cleared	One or two instruments per link
Financial instruments cleared	Cash equities, equity derivatives and government bonds (cash and repo)
Are CCPs able to call intraday margins from a linked CCP?	Yes
Is the same margining methodology applied by both CCPs?	No, but comparable outcomes
Default fund calculated to cover inter-CCP exposures?	Varies across CCPs and within links
Default fund available to cover inter-CCP losses?	Varies across CCPs and within links
Form of collateral exchanged	The same as for clearing members in the majority of the interoperability arrangement
Rehypothecation of collateral?	Collateral is generally not rehypothecated
Impact on surviving CCP's clearing members if linked CCP defaults	Some CCPs allow the mutualisation of losses that exceed the inter-CCP margin and CCP skin in the game. Others have no <i>ex ante</i> mutualisation (via default funds and/or loss allocation arrangements).

There is more diversity in terms of whether each CCP's default fund is calculated and/or available to cover exposures from linked CCPs, owing to the absence of specific EMIR provisions in this regard. Two CCPs calculate their default funds to include interoperable CCP exposures, while three CCPs do not make the default fund available to meet losses resulting from interoperable CCPs. In all interoperability arrangements except the CC&G – LCH SA link, CCPs fund their inter-CCP margin liabilities with additional margins from their clearing members – i.e. assets other than collateral that are requested from clearing members to cover the CCP's direct exposure to clearing members.

As regards default management, most of the interoperable CCPs would treat a defaulting linked CCP as if it were a clearing member holding house positions only. This means that the surviving CCP would seek to liquidate the failed CCP's open positions and offset any losses against the margins posted by the defaulting CCP. The trading activity and the open positions of the surviving CCP's clearing members would therefore not be affected.

5. An assessment of the systemic risk implications of CCP interoperability arrangements

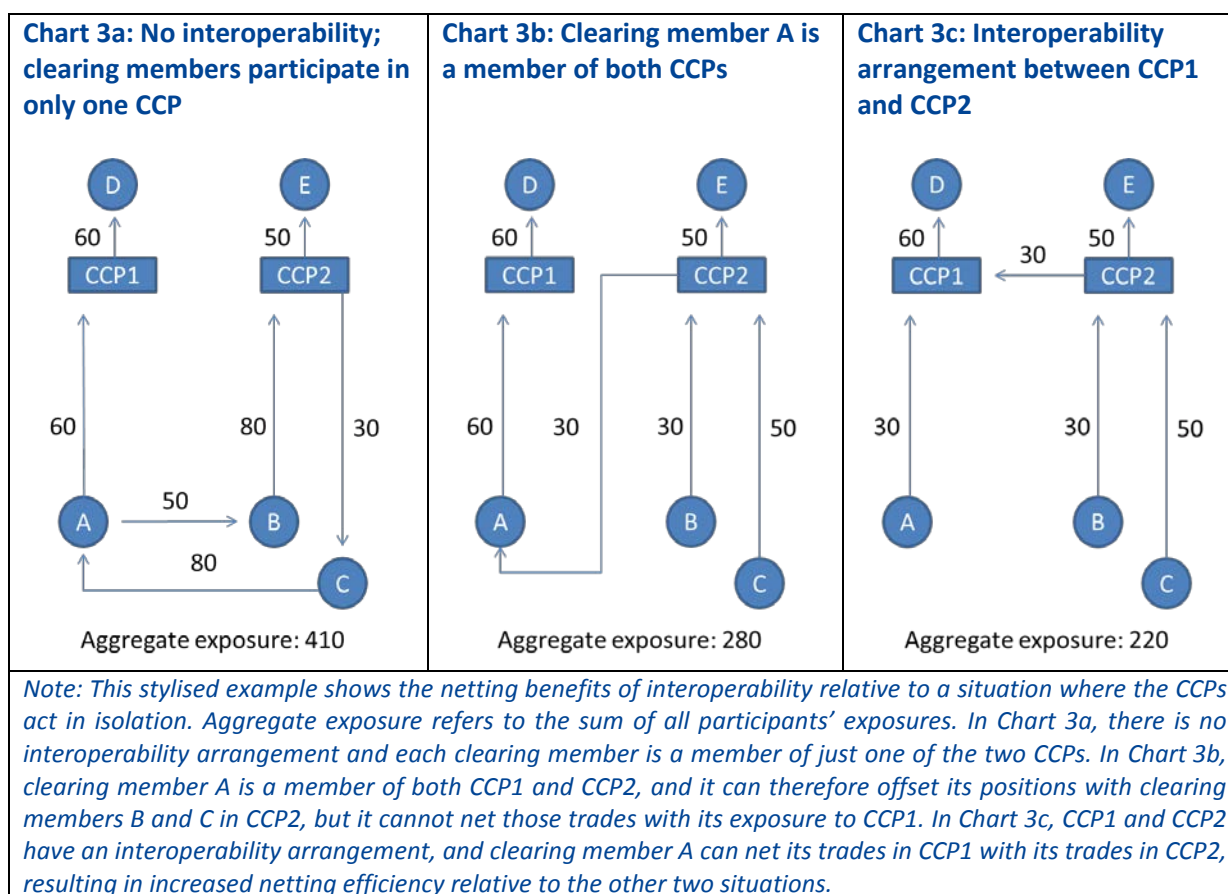
Benefits from a systemic risk perspective

The financial stability benefits of multilateral netting have been cited as an argument for having a single, global CCP that clears all asset classes. Duffie and Zhu (2011) use a theoretical framework to show that this would ensure the highest degree of netting, thereby reducing aggregate credit risk (and, as a result, lowering demand for collateral) relative to a world with several CCPs. Cont and Kokholm (2014) find slightly differing results. They emphasise that the benefits deriving from multilateral netting as a result of clearing all trading in a single CCP have to be measured against the systemic risks that this entails. Netting also reduces the number and value of deliveries (for individual financial instruments) and payments that are needed to settle a given set of trades, which reduces liquidity risks and transaction costs (CPSS-IOSCO, 2012).

When more than one CCP is in operation, the netting efficiency of a single, global CCP may, to some extent, be achieved through CCP interoperability arrangements. Such links allow clearing members not only to offset long and short positions vis-à-vis clearing members of the linked CCPs, similar to a situation where they are members of both CCPs (as illustrated in Chart 3b), but also to net positions across the two CCPs, allowing a higher degree of netting (see Chart 3c). The increase in netting efficiency reduces aggregate exposure in the system and thus the potential losses for CCPs and participants. This limits the potential for contagion if one or more participants default.

Multilateral netting arising from interoperability arrangements also reduces the need for collateral in the system to the extent that the reduction in collateral due to smaller aggregate exposures is greater than the increase in collateral needed to cover inter-CCP exposures. Relative to a world with just one global CCP, interoperability arrangements may result in relatively higher collateral requirements, as extra protection may be needed for the link. In particular, the CCP may ask for an additional margin from its clearing members to cover inter-CCP exposures. As a consequence, clearing members may ask for additional initial margins from their clients to cover the additional margin called by the CCP and to protect the clearing member against a default by a linked CCP. However, where clearing is more fragmented, the increased netting efficiency of interoperability arrangements has the potential, *ceteris paribus*, to reduce the overall need for collateral in the system. For an empirical assessment on a case-by-case basis of the final net outcome of the increased netting efficiency relative to the potential higher collateral demand to back the inter-CCP exposure, a quantitative analysis would be necessary.

A reduced need for collateral also decreases liquidity risks for participants by limiting the size of intraday margin calls and by lessening the pro-cyclical effects of margin calls (Duffie and Zhu, 2011).



Interoperability between CCPs increases market access in the form of an increase in the number of counterparties trading in the market that are served by a given CCP, or an increase in the range of products that can be cleared through that CCP, while the clearing member can avoid the cost of being a member of multiple CCPs. This lowers costs for counterparties relative to the use of stand-alone CCPs or cross-margining, as participants in a cross-margining arrangement must clear their transactions at both CCPs. The fact that clearing members are not as locked-in may reduce the level of membership fees, as CCPs will have to compete more for clearing members. This may also support market liquidity by making it less expensive for clearing members to access a wider range of trading counterparties.

In the presence of interoperability, the benefits of netting, enhanced market liquidity and fewer locked-in clearing members in a specific CCP ensure that the benefits of competition between CCPs are not reduced by negative effects on market fragmentation. Compared with a position split across two CCPs, interoperability also gives CCPs greater transparency as regards the aggregate positions cleared by their respective clearing members.

Lastly, interoperability arrangements may reduce complexity for clearing members, who would otherwise have to manage collateral calls from other CCPs and transfers of collateral across CCPs (CPSS, 2010).

Table 2: Main systemic risk implications of interoperability arrangements

Main benefits	Main threats
• Reduced aggregate exposures • Reduced aggregate collateral needs • Reduced liquidity risk • Reduced complexity for clearing members • Substitutability	• Introduces the risk of inter-CCP contagion owing to: - o inter-CCP exposures - o possible under-collateralisation of inter-CCP positions - o operational risks/complexity in the risk management frameworks of CCPs

Threats from a systemic risk perspective

The above-mentioned benefits of a single, global CCP have to be weighed against the systemic risks associated with the creation of a single point of failure in the financial system.

The type and level of risk posed by a link will depend on several factors, including the degree of integration, the characteristics of the products cleared through the link and the risk management implemented in the CCPs involved.

The introduction of inter-CCP exposures

As indicated above, interoperability arrangements between CCPs can reduce participants' aggregate exposures through multilateral netting. However, interoperability arrangements also introduce exposures between CCPs, which need to be properly managed and backed by collateral.

Cox et al. (2013) assess the net impact of a move from two unlinked CCPs to two CCPs with an interoperability arrangement in terms of expected exposures in the system. Comparing the reduction in CCPs' exposure to their clients with the increase in inter-CCP exposures, they show that interoperability generally has a positive effect on systemic risk by reducing aggregate credit risk (defined as the expected loss given the default of a CCP participant). Cox et al. do not consider other possible implications of interoperability, such as complexity and contagion in periods of stress, which are important issues and will be discussed later in this report. Instead, they concentrate on the reduction in systemic risk brought about by netting, showing that the net reduction in exposure due to interoperability arrangements depends on the characteristics of the market: exposure decreases with the number of participants in the linked CCPs and asymmetry in the number of participants in each CCP (both increasing multilateral netting efficiency relative to bilateral netting). Volatility and the extent to which participants have been members of both CCPs before the CCPs are linked also matters: the systemic risk brought about by interoperable CCPs depends on the characteristics of the market being cleared.

Anderson et al. (2013) find support for the conclusion that the desirability of a CCP link depends on the number of participants. They show that a configuration where members clear domestic trades through a domestic CCP while using a global CCP for international transactions is more efficient than establishing a link between the two CCPs if the number of clearing members in the domestic CCP is small and foreign participants do not join the domestic CCP in the absence of a link. Furthermore, they show that, under certain circumstances, overall exposure in the financial system could increase with interoperability between CCPs relative to an absence of links.

The inter-CCP exposures that are introduced by an interoperability arrangement may reduce exposure in the system as a whole, as described above, but they also introduce a new channel for potential contagion. The introduction of direct inter-CCP exposures means that stress affecting a CCP with an interoperable link could be transmitted to the other CCP and then spread to other market participants. Appropriate CCP stress testing is useful in order to understand these contagion risks.

Additionally, each CCP is also indirectly exposed to the risk of clearing members in the other CCP defaulting (even if those clearing members are not users of the interoperability arrangement) to the extent that they could impair the CCP's ability to repay. Article 52(2) of EMIR states: *"Where the risk-management models used by the CCPs to cover their exposure to their clearing members or their reciprocal exposures are different, the CCPs shall identify those differences, assess risks that may arise therefrom and take measures, including securing additional financial resources, that limit their impact on the interoperability arrangement as well as their potential consequences in terms of contagion risks and ensure that these differences do not affect each CCP's ability to manage the consequences of the default of a clearing member."* However, a CCP and its members might still not be fully aware of how risks are managed in the interoperating CCP or have full visibility regarding other links that the interoperating CCP is participating in. This may amplify contagion risks. In theory, one such CCP could have weaker membership requirements or weaker margin requirements for its members, which would increase the probability of it defaulting, so the first CCP would be indirectly linked to lower risk standards than it would usually accept. For this reason, the ESMA guidelines state: *"In applying general Guideline and Recommendation 3, NCAs should at least take into account the following:*

- i. That the CCP has assessed the risk profile of each interoperating CCP, including any risks that may arise from its membership policies, to ascertain that the interoperability arrangement does not result in a weakening of the CCP's overall risk management framework;*
- ii. That the CCP has policies, procedures and systems to regularly monitor, assess and mitigate any risk arising from interdependencies, including from entities or groups of entities acting as clearing members or providers of essential services to one or more interoperable CCP..."*

Against this background, the ESRB confirms that, from a macro-prudential point of view, it is important that the contagion or “weakening guarantee systems” risks that are potentially associated with interoperability arrangements are managed effectively and collateralised in an adequate manner. Constant dialogue and exchanges of information between linked CCPs and their competent authorities are also crucial to prevent such risks, as is rightly foreseen by the ESMA guidelines.

Collateralisation

Whether and how collateral received by CCPs from participants is used to cover inter-CCP exposures is important for the management of inter-CCP risks and the potential for contagion across CCPs. According to the ESMA guidelines, CCPs should assess, collect or have access to the inter-CCP resources necessary to cover credit and liquidity risks arising from the interoperability arrangement, including in extreme but plausible market conditions.

A CCP is generally less likely to default than a clearing member of a CCP, provided that the CCP manages its various risks effectively. This stems from the assumption that CCPs are not risk-taking entities in the same way that clearing members are (CCPs are essentially neutral in terms of market risk.) The reduced risk for CCPs that are subject to a prudent regulatory risk management framework is also reflected in the prudential regulation of banks, which applies a favourable weighting to banks’ exposures resulting from transactions cleared by qualifying CCPs (i.e. PFMI-compliant). However, for a CCP, the default of a linked CCP may be significantly worse than the default of a clearing member if a substantial amount of that CCP’s business is cleared via that link.

As linked CCPs do not contribute to each other’s default funds,¹⁰ a CCP will not incur losses if the default fund of an interoperable CCP is used to cover losses arising from a default by its clearing members. This ensures that contagion cannot take place through this channel. Other additional resources should be and are exchanged by interlinked CCPs to cover extreme losses not covered by margins. It should be noted, in this respect, that inter-CCP exposures are backed by collateral whose amount is determined by specific risk-management systems tailored to the features of these arrangements, to compensate for the absence of default fund contributions. From a macro-prudential perspective, it is essential that the tailored features do not introduce weaknesses into a CCP’s overall risk management system. In this respect, the ESRB shares the approach embedded in the PFMI and the EU’s regulatory framework, whereby exposures between interoperable CCPs must be dealt with at least as rigorously as exposures vis-à-vis clearing members, and the ESRB expects that approach to be carefully followed in the ongoing supervision by the relevant NCAs.

¹⁰ As explained in Section 3, CCPs are not allowed to contribute to each other’s default funds to cover credit risks vis-à-vis other CCPs, which is why CCPs typically exchange additional margins as collateral.

Risk associated with reuse of margins

If a CCP uses margins called to cover its exposure to clearing members to fund also its initial margin liabilities vis-à-vis an interoperable CCP, there could be a risk of under-collateralisation. Under-collateralisation stemming from the reuse of margins happens if the margins that a CCP collects from its clearing members are less than those required by the interoperable CCP. This would result in an increased risk of contagion from a defaulting linked CCP to clearing members if the CCP's own funds were not sufficient to absorb losses caused by the defaulting CCP. Mägerle and Nellen (2011) show that reuse of margins to cover inter-CCP exposures is more likely to result in under-collateralisation if the linked CCPs use different margining models¹¹ or multilateral links are established. If the linked CCPs apply different margining models, the degree of under-collateralisation will be positively correlated with the difference between the CCPs' margining models and the number of transactions cleared through the link. CCPs participating in an interoperability arrangement should therefore identify any risks they may be exposed to as a result of the operation of different risk management methods and ensure that any such risks are subject to adequate mitigation. The situation is complicated further in the presence of multiple CCP links that reuse initial margins to cover inter-CCP exposures (of course, if clearing members' margins are not reused, such a complication does not arise). In that case, using the same margining model is no longer sufficient to ensure proper collateralisation, as traders in a multiple interoperability structure may accumulate offsetting positions vis-à-vis their own CCPs, while their CCPs' inter-CCP positions are not offset.

Importantly, where CCPs fund inter-CCP margins independently of clearing member exposures, there is not the same risk of under-collateralisation. ESMA Guideline 3(a)(i) states that an interoperability arrangement should not *"impact on the compliance by the CCPs ... In this respect, these requirements should be met by each CCP on a standalone basis, in particular with reference to prefunded financial resources including margins"*. This could be interpreted as suggesting that any margin posted by one CCP to another CCP should be separate from and additional to the margins already collected by a CCP to cover its exposures to clearing members, and that margin should not be reused. However, it should be noted that neither the EMIR Level 1 provisions nor the PFMI provide for such a limitation.¹² For this reason, jurisdictions either allow or disallow the reuse of margins. If they are allowed, adequate guarantees must be put in place. If they are disallowed, the CCP may

¹¹ The ESMA guidelines require the NCAs responsible for interoperable CCPs to (i) establish a process for regularly assessing any differences between the risk management frameworks of the relevant CCPs, (ii) identify any risks that may arise from the use of such different models or controls (including assessment of the results of stress tests and the testing of default procedures) and (iii) put arrangements in place to mitigate those risks.

¹² Paragraph 3.20.16, which concerns Principle 20 on FMI links, states: *"If a CCP is allowed to reuse its participants' collateral to meet an inter-CCP margin requirement, such collateral provided by the first CCP must be unencumbered and its use by the linked CCP in the event of the default of the first CCP must not be constrainable by actions taken by the participants of the first CCP."*

be required to call additional margins from clearing members, which could be used as inter-CCP margins.

However, it should be noted, in this respect, that over-collateralisation can also result in costs for a clearing system. In a financial crisis, collateral could become a scarce good, and inefficient use of it could exacerbate the crisis. Moreover, as Mägerle and Nellen (2011) point out, given that CCPs collect several billion euro's worth of collateral in cash equity markets alone, over-collateralisation could have significant economic consequences. Stringent requirements in terms of collateralisation could lead to a situation where the use of CCPs (including the use of links) is not considered commercially viable owing to the opportunity cost of collateral and the fees for CCP clearing. Consequently, the challenge for regulators is to ensure that CCPs strike the right balance between the risk of contagion due to under-collateralisation and the negative consequences of overly prudent collateral requirements.

It is also important that the collateral posted by clearing members is readily available to the CCP, as any delays in accessing collateral may create liquidity shortages for the CCP. Delays can arise because of operational and legal issues. These are more likely to occur if the margins posted by clearing members are reused to cover inter-CCP exposures. In this respect, EMIR is even stricter than the PFMLs and requires any collateral posted in an interoperability arrangement to be readily available to the posting CCP should the other CCP default.

Avoiding margin add-ons

Some clearing members have membership of two or more CCPs, despite interoperability arrangements being set up between those CCPs. There are several possible reasons for doing this, e.g. to offer clients access to a variety of CCPs. However, there is a risk that a clearing member could take advantage of this situation to hide a large trading position, which could be divided among the various CCPs to avoid additional margins. This risk also exists when CCPs are not linked (Glasserman et al., 2015), although it is more likely when they are. Further analysis would be necessary to quantify the materiality of this risk.

Pro-cyclicality of inter-CCP margining

EMIR and the relevant delegated legislation contain several provisions whereby CCPs and market participants handling bilaterally cleared financial instruments are required to duly consider the potential pro-cyclical implications of their decisions. In particular, Article 28(1) of Commission Delegated Regulation (EU) No 153/2013, which sets out regulatory technical standards under EMIR, specifies three ways in which a CCP can take account of the potential pro-cyclicality of margin requirements. The first option is a margin buffer, which it allows to be temporarily exhausted in periods when calculated margin requirements are rising significantly. The second option involves assigning at least a 25% weight to stressed observations in the look-back period, while the third option involves applying a margin floor calculated on the basis of a ten-year historical look-back period. A CCP must employ at least

one of these three options. It is not clear to what extent these provisions should be applied to inter-CCP margins. The authorised CCPs that have interoperability arrangements in place are currently applying the same margining methodology to both inter-CCP margin requirements and clearing members, meaning that those measures in Article 28(1) should also be in place for inter-CCP margins. It would, however, be beneficial to make this an explicit requirement.

Complexity/operational risk

For CCPs, the level of operational risk increases when they enter into an interoperability arrangement, as operational issues that limit the ability of a CCP to process cleared transactions will affect a linked CCP (Garvin, 2012). These operational issues will increase significantly if more than two CCPs are linked. Furthermore, operational issues in one CCP could lead to the suspension of trading activity at all trading venues connected to linked CCPs. The level of complexity also increases, as CCPs will have to frequently measure exposure to the linked CCP. Similarly, harmonising margining models with a linked CCP may also add to the complexity (CPSS, 2010).

Derivatives and interoperability

In its July 2015 report under Article 85(3)(d) of EMIR, ESMA proposed extending the scope of EMIR to cover ETDs, but not OTC derivatives at this stage (see also Section 3). Financial instruments such as derivatives – both OTC derivatives and ETDs – with long maturities and significant leverage effects are more complex than transferable securities and money market instruments, which are typically settled within a few days. Transferable securities markets, such as equities and bonds, operate on a T+2 basis, with collateralisation against market risk proportionate to the short settlement lag; moreover, the use of delivery-versus-payment mechanisms avoids exposures at the moment of settlement. Derivatives are generally longer-term products, with contracts potentially maturing a number of years after they have been entered into, and are used mainly by professional investors.

ESMA expects NCAs to apply its guidelines when approving links covering cash products or conducting assessments of any existing or proposed derivatives links. In this respect, in line with the details given in the paragraph on policy proposals, the ESRB stands ready to contribute to the carrying out of further analysis regarding the specificities relating to derivatives links, particularly the complexities relating to potential OTC derivatives links, from a macro-prudential perspective,.

CCPs' recovery and resolution

The introduction of interoperability may change CCPs' membership structures, as clearing members may be incentivised to be a member of only one of the linked CCPs. This could lead to an increased concentration of clearing members and a reduced number of clearing members in individual CCPs. This would leave fewer surviving clearing members available

to bid in the portfolio auction process and to share the burden of loss allocation if a clearing member defaulted.

Interoperability may prove beneficial in the event of a default by a single-asset CCP (or, from the perspective of the financial asset cleared through the link, in the event of a default by a large multi-asset CCP), in terms of both substitutability and portability. The fact that multiple CCPs are clearing the same financial instruments could increase the likelihood of a defaulting CCP being quickly replaced by another CCP. If these CCPs are connected to the same trading venues and are interoperable, there might even be an increased likelihood of these markets continuing to be served in the event of a CCP defaulting. The extent to which interoperability may increase the likelihood of successful portability in resolution remains an open issue. ESMA guidelines specify that CCPs should consider the extent to which the portability of positions from a defaulting CCP to a non-defaulting CCP or the default fund of the interoperable CCP (which is dedicated to covering exposures arising from financial instruments cleared through the interoperability arrangement) would contribute to the lowering of inter-CCP exposures. This suggests that interoperability arrangements may increase the chances of successful portability in resolution, where clearing members' activities have to be transferred to a surviving CCP in a short period of time. However, it is noted at the same time that industry representatives do not currently see the porting of clearing members' open positions to an interoperating CCP as a viable option at short notice: *"Membership criteria may be significantly different across CCPs, preventing in practice the porting of such positions. Equally, documentation cannot be set up quickly enough, and during a default there is no time for the receiving CCP to perform due diligence on these CMs. The only way we can envisage such porting working is if firms have already set up 'back-up' membership arrangements at the receiving CCP."* (ISDA, 2015).

6. Conclusion and policy proposals

This report constitutes the first ESRB report on systemic risks associated with interoperability arrangements.

The fragmented trading industry in the EU has led to demand for interoperability arrangements. There are currently five links in operation in the EU, linking four authorised EU CCPs, a Swiss CCP and its Norwegian branch. Those links typically clear only a single instrument class, with cash equities being the most common, while one link covers also equity derivatives and another covers only government bonds.

All of the CCPs involved in interoperability arrangements exchange margins as a first way of mitigating inter-CCP counterparty risk, and the methodology used to calculate the margins they require from linked CCPs is similar to that applied to their clearing members. However, differences can be seen in the risk management of interoperability arrangements when considering other parts of the framework, including the calculation of default funds, the reuse of margins to cover inter-CCP exposures, and default management procedures in the event

of a CCP defaulting. Those differences can be explained by the flexibility provided by the regulatory framework, which gives CCPs and NCAs some freedom when it comes to interpreting how to structure the various features of interoperability arrangements.

For derivatives links, there is a particularly large degree of freedom, as derivatives are not covered by Title V of EMIR and no specific recommendations have been developed for such interoperability arrangements or the specific risks arising from them. When it comes to the assessment of existing derivatives links, ESMA encourages CCPs and relevant NCAs to apply the ESMA guidelines for links covering cash products.

Interoperability arrangements between CCPs may result in some benefits from a systemic risk perspective. The increased potential for the netting of exposures across CCPs reduces the potential for contagion if one or more participants default. Netting also generally reduces liquidity risks for participants by reducing the size of intraday margin calls, as the collateral in the system declines with the level of exposure. Furthermore, interoperability arrangements may also reduce complexity for clearing members, who would otherwise have to manage collateral calls from additional CCPs and transfers of collateral across CCPs. The fact that multiple CCPs are connected to the same trading platforms and markets also increases the likelihood of those markets continuing to be served in the event of a CCP defaulting. Substitutability and portability can also be achieved if two unlinked CCPs clear the same product.

The establishment of interoperability arrangements introduces exposures between CCPs, which is a potential additional channel for contagion between CCPs if risks are not properly managed or very extreme scenarios arise. This may increase systemic risks in the financial system. Direct inter-CCP exposure means that stress in one of the markets served by the CCP link could be transmitted to the linked CCP, and then to other market participants. Each CCP is also indirectly exposed to the risk of clearing members in the other CCP defaulting, even if those clearing members are not users of the interoperability arrangement. This indirect contagion materialises in the extreme event that a CCP's ability to meet its obligations is impaired by the default of one or more of its clearing members. The likelihood of a CCP and its members incurring losses as a consequence of a link increases if the CCP links to a CCP that has a weaker risk management framework or lower risk standards. Furthermore, CCPs and their members may not be fully aware of how risks are managed in the interoperating CCP or have full visibility regarding other links that the interoperating CCP is participating in. Any lack of transparency will increase the risk of contagion, as the CCP will not be able to manage those risks.

Even in the event of full transparency, a CCP will face additional risks when entering into an interoperability arrangement. Operational risk increases, as the exposure to the linked CCP has to be measured frequently and systemic problems in one CCP that limit its ability to process cleared transactions will directly affect the linked CCP. A CCP's membership

structure may also change, as clearing members may then have an incentive to be a member of only one of the linked CCPs. This could lead to a reduction in the number of clearing members in individual CCPs, which would mean fewer surviving clearing members being available to bid in the portfolio auction process and share the burden of loss allocation if a clearing member defaulted.

In terms of inter-CCP margining, it is important that any reuse of margins collected by the CCP to cover its exposure to clearing members does not result in under-collateralisation or impair the CCP's immediate access to collateral in the event of a clearing member defaulting on its obligations. If these requirements are not met, such reuse may result in contagion as regards losses and liquidity stress in the CCP.

The ESRB notes that the above risks are considered and addressed in the current regulatory framework, both at international and at EU level. However, this bears repeating given that the potential future development of interoperability arrangements between CCPs could result in the scale of such risks becoming of systemic concern.

The ESRB also notes that the existing interoperability arrangements between CCPs in Europe mostly concern cash instruments such as equities and have been approved by the relevant NCAs and colleges of supervisors in the context of the EMIR reauthorisation process for EU-based CCPs. The ESRB also takes note that, at least in one case, a sub-CCP arrangement, which was more a kind of participant link than a complete interoperability arrangement, has been discontinued by the relevant CCPs – according to these CCPs this was because of doubts regarding its economic viability in light of the EMIR requirements.

In the opinion of the ESRB, the regulatory framework under EMIR has raised the bar compared with the previous situation. Moreover, it does not appear to stand in the way of the further expansion of interoperability arrangements between CCPs, at least for transferable securities and money market instruments. Furthermore, the ESRB notes that the CPMI-IOSCO Level 2 assessment showed that the EU's regulatory framework for links complies with the PFMIs.

The ESRB's first assessment of existing CCP interoperability arrangements and analysis of the systemic risk implications of such arrangements confirms the soundness of the EU's current regulatory framework, while identifying areas where, from a macro-prudential point of view, further work and clarification should be considered:

- **Ensuring a harmonised framework.** The existing framework provides NCAs with some flexibility in the interpretation of EMIR Level 1 text and the ESMA guidelines. So far, this has not resulted in inconsistent national frameworks, also bearing in mind the fact that most of the few links established thus far in the EU concern just one asset class. However, given the possibility of a further expansion of interoperability

arrangements, the ESRB considers that there is scope for more granular and prescriptive regulation. This would provide clarity for supervisors and regulators alike, ensure harmonised implementation in the future, and avoid any possibility of regulatory arbitrage. The ESRB sees room for further regulatory granularity in order to address macro-prudential contagion concerns in the following areas:

- o the coordination of risk management between interoperable CCPs;
- o the possible harmonisation of membership criteria between interoperable CCPs;
- o the possibility of calling additional margins from clearing members to cover risks arising from interoperability arrangements;
- o the margining model used for inter-CCP margins;
- o the treatment of exposures to linked CCPs in the CCPs' own stress testing (also for the calculation of the respective default funds).

It is important, in this regard, to ensure that any development of more granular and prescriptive regulation does not reduce the risk mitigation standards applied to CCPs relative to the current situation or lead to the over-collateralisation of inter-CCP exposures, and that the EU's regulatory framework remains consistent with international standards.

- **Recovery and resolution.** While work on recovery and resolution frameworks is ongoing, the ESRB considers that two aspects should be taken into account. First, it may be useful to clarify the manner in which interoperability arrangements operate at the end of each CCP's default waterfall if there is an uncovered inter-CCP exposure (e.g. if contracts are 'torn up'). Second, clarification is also required as to whether and how interoperability arrangements may increase the likelihood of successful portability or affect other relevant default management devices. The forthcoming legislation could provide further guidance in this respect.
- **Interoperability arrangements for derivatives.** The recent ESMA report on extending the scope of CCP interoperability arrangements to cover financial instruments other than transferable securities and money market instruments recommends "*extending the EMIR provision related to interoperability arrangements to ETD only. A further extension to OTC Derivatives should be assessed at a later stage*". The ESRB would like to point out that there may, in future, be demand from CCPs to establish new interoperability arrangements handling derivatives, especially with the clearing obligation for OTC derivatives in place, and that the clearing of transactions in derivatives requires significantly more attention than for transferable securities and money market instruments. Against this background, the ESRB concurs that, also from a macro-prudential point of view, further analysis is needed regarding the specificities and complexities relating to potential new derivatives links – particularly the complexities relating to potential OTC (as currently classified) derivatives links. This analysis should provide a basis for assessing the extent to which EMIR's existing Level 1 text and the ESMA guidelines cover the risks that are specific to derivatives links (particularly for OTC derivatives) and where adjustments

are necessary.¹³ The ESRB stands ready to provide a macro-prudential contribution to such analysis.

- **Role of the ESRB.** Given the systemic relevance of interoperability arrangements for CCPs, the ESRB should be given a consultative role in the development of any future guidelines and rules pertaining to interoperability. That would supplement the role currently assigned to the ESRB under EMIR by including specific responsibility for an issue which could give rise to significant contagion effects.

¹³ In November 2011 the BIS Committee on the Global Financial System (CGFS) published a report entitled “The macrofinancial implications of alternative configurations for access to central counterparties in OTC derivatives markets”. On the subject of links between CCPs for OTC derivatives, it said: *“In practice, while a few CCP links exist (for cash markets in particular), there is as yet no generally accepted model that could be used for establishing links among CCPs clearing OTC derivative trades. Such links would, by their nature, pose legal, credit and liquidity risks that would need careful examination before they became operational.”* In the CPSS-IOSCO PFMI, no specific provision is made for CCP links handling OTC derivatives (Principle 20). However, the section on the principle on margins (Principle 6) states: *“For example, OTC derivatives require more-conservative margin models because of their complexity and the greater uncertainty of the reliability of price quotes.”* The ESRB believes that this cautious approach should also be applied to CCP links involving derivatives.

Literature

Anderson, S., Dion, JP. and Saiz, H. Perez (2013), "To link or not to link? Netting and exposures between central counterparties", *Bank of Canada Working Paper*, No 2013-6.

Bank of England (2014), *Implementation by the Bank of England of ESMA's Guidelines and Recommendations on CCP interoperability arrangements*.

CGFS (2011), *The macrofinancial implications of alternative configurations for access to central counterparties in OTC derivatives markets*, CGFS Paper No 46.

Cont, Rama, and Kokholm, Thomas (2014), "Central Clearing of OTC Derivatives: bilateral vs multilateral netting", *Statistics & Risk Modeling*, 31(1) pp. 3-22.

Cox, N., Garvin, N. and Kelly, G. (2013), *Central counterparty links and clearing system exposures*, Research Discussion Paper 2013-12, Reserve Bank of Australia.

CPSS (2010), *Market structure developments in the clearing industry: implications for financial stability*, report by the Working Group on Post-Trade Services.

CPSS-IOSCO (2012), *Principles for Financial Market Infrastructures*.

Duffie, D. and Zhu, H. (2011), "Does a central clearing counterparty reduce counterparty risk?", *The Review of Asset Pricing Studies*, 1(1), pp. 74-95.

ESMA (2013), *Final report – Guidelines and Recommendations for establishing consistent, efficient and effective assessments of interoperability arrangements*.

ESMA (2015), *Final report – The extension of the scope of interoperability arrangements*.

Garvin, N. (2012), "Central counterparty interoperability", *RBA Bulletin*, June, pp. 59-68.

Glasserman, P., Moallemi, C.C. and Yuan, K. (2015), *Hidden Illiquidity with Multiple Central Counterparties*. Office of Financial Research Working Paper 15-07.

Heller, D. and Vause, N. (2012), *Collateral requirements for mandatory central clearing of over-the-counter derivatives*, BIS Working Paper No 373.

ISDA (2015), *ISDA response to BoE consultation on CCP interoperability*.

Jackson, J.P. and Manning, M.J. (2007), *Comparing the pre-settlement risk implications of alternative clearing arrangements*, Bank of England Working Paper No 321.

JRA (2008), *Investigation of risks arising from the emergence of multi-cleared trading platforms*, Joint Regulatory Authorities of LCH.Clearent Group.

Mägerle, J. and Nellen, T. (2011), *Interoperability between central counterparties*, Swiss National Bank Working Paper 2011-12.

Annex 1

Interoperable link	CC&G – LCH SA	EuroCCP – LCH Ltd	EuroCCP – SIX x-clear AG	LCH Ltd – SIX x-clear AG	LCH Ltd – SIX x-clear NB (Norwegian branch)
Start date for link	August 2004	6 January 2012	Former <u>EuroCCP Ltd</u> : ¹⁴ August 2011 (“refereed interoperability”) Former <u>EMCF NV</u> : January 2012	May 2003	November 2003*
EMIR approval date	20 May 2014 (CC&G) and 23 May 2014 (LCH SA)	1 April 2014 (EuroCCP) and 12 June 2014 (LCH Ltd)	1 April 2014 (EuroCCP)	12 June 2014 (LCH Ltd)	12 June 2014 (LCH Ltd)
Financial instrument(s) cleared	Italian government bonds (cash and repo)	Cash equities	Cash equities	Cash equities	Cash equities and equity derivatives

¹⁴ European Central Counterparty NV (EuroCCP) was formed in 2013 as a result of a merger between EuroCCP Ltd and EMCF NV, both of which were formed in 2007.

Annex 2

Instrument class	Number of EU CCPs authorised to clear instrument class	Number of third country CCPs recognised as clearing instrument class¹⁵	Interoperability arrangement in place in EU?
Cash equities – OTC	7	1	Yes
Cash equities – exchange-traded	10	4	Yes
Cash debt – OTC	6	3	Yes
Cash debt – exchange-traded	8	4	Yes
Equity derivatives – OTC	3	3	No
Equity derivatives – exchange-traded	8	7	Yes
Debt derivatives – OTC	5	3	No
Debt derivatives – exchange-traded	5	5	No
Interest rate derivatives – OTC	6	5	No
Interest rate derivatives – exchange-traded	5	5	No
Inflation rate derivatives – OTC	2	2	No
Inflation rate derivatives – exchange-traded	0	2	No
Credit derivatives – OTC	1	3	No
Credit derivatives – exchange-traded	0	2	No
Currency derivatives – OTC	2	4	No
Currency derivatives – exchange-traded	7	7	No
Commodities derivatives – OTC	6	3	No
Commodities derivatives – exchange-traded	12	5	No
Emissions/climate derivatives – OTC	3	2	No
Emissions/climate derivatives – exchange-traded	3	2	No
Freight – OTC	3	3	No
Freight – exchange-traded	3	3	No
Repos – OTC	6	2	No
Repos – exchange-traded	2	0	Yes
Securities lending	2	0	No
Collateralised euro deposits	1	0	No
Derivatives that are not MiFID financial instruments	2	0	No
Assets that are not MiFID financial instruments	3	0	No

¹⁵ “Exchange-traded” here means that the execution of the financial instrument takes place in a third country market that is not considered equivalent to a regulated market.