

HOW TO DEAL WITH THE RESOLUTION OF FINANCIAL MARKET INFRASTRUCTURES

2ND INTERIM REPORT

OF THE

CEPS TASK FORCE

ON

IMPLEMENTING FINANCIAL SECTOR RESOLUTION

OCTOBER 2016

Abstract

Financial market infrastructures (FMIs) are the backbone of the financial system: they enable market participants to transact with one another in an efficient manner. FMIs are inherently systemic, as their very names imply: payments systems, central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs) and trade repositories (TRs). If an FMI were to cease operation, it could put a stop to payments and/or securities and derivatives transactions. This in turn could destabilise financial markets and possibly the economy at large.

To avoid such an outcome, steps should be taken to ensure that FMIs' critical economic functions continue, even if a particular FMI were to fail. Theoretically, if one FMI fails, market participants could shift to another or start a new one. That could be enough to ensure continuity. Practically, however, more will be required. FMIs will need to become robust. By robust we mean two things: that the FMI is extremely unlikely to fail, and that the FMI is resolvable, if it were to fail. To this end, FMIs should prepare recovery plans and authorities should prepare resolution plans. This report highlights the issues that such plans should consider and outlines some options for how the plans might address them

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CEPS is an independent think tank based in Brussels. Its mission is to produce sound policy research leading to constructive solutions to the challenges facing Europe today.

This report is based on discussions in the CEPS Task Force on “Implementing Financial Sector Resolution” and was complemented by substantial additional research. The members of the Task Force participated in extensive discussions in the course of several meetings, and submitted comments on earlier drafts of the report. Its contents convey the general tone and direction of the discussions, but its recommendations do not necessarily reflect a common position reached by all members of the Task Force. Nor do they represent the views of the institutions to which the members or Chairman belong. A list of participants and invited guests and speakers appears in Annex 2 at the end of this report. The chair and rapporteur of the Task Force is Thomas F. Huertas, Partner and Chair, EY Global Regulatory Network.

This second interim report focuses exclusively on financial market infrastructures and follows the first interim report on banking sector resolution in the EU. A final report will be published later this year with additional chapters on non-bank resolution.

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List of Abbreviations

BCBS	Basel Committee on Banking Supervision
BRRD	Bank Recovery and Resolution Directive
CCP	Central counterparty
CDS	Credit Default Swap
CEPS	Centre for European Policy Studies
CHIPS	Clearing House Interbank Payments System
CLS	Continuous Linked Settlement
CPSS	Committee on Payment and Settlement Systems
CSD	Central Securities Depositories
CSDR	Central Securities Depositories Regulation
DVP	Delivery Versus Payment
CPMI	Committee on Payments and Market Infrastructures
ECB	European Central Bank
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
EU	European Union
F&O	Futures & Options
FEDWIRE	Federal Reserve E-Payments Routing Directory
FICC	Fixed Income Clearing Corporation
FMI	Financial market infrastructure
FSB	Financial Stability Board
FSOC	Financial Stability Oversight Council
FX	Foreign Exchange
G-SIBs	Global systemically important banks
G-SIFIs	Global systemically important financial institutions
ICMA	International Capital Market Association
IM	Initial Margin
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association
JSCC	Japan Securities Clearing Corporation
NSCC	National Securities Clearing Corporation
OCC	Options Clearing Corporation
OTC	Over-the-counter
PONV	Point of non-viability

PVP	Payment versus Payment
QCCP	Qualifying Central Counterparty
RTGS	Real-time gross settlement systems
SSSs	Securities Settlement Systems
T2S	TARGET2-Securities
TA	Temporary administrator
TARGET	Trans-European Automated Real-time Gross settlement Express Transfer system
TR	Trade Repositories
VM	Variation Margin
VMGH	Variation Margin Gains Haircutting

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2ND INTERIM REPORT OF THE CEPS TASK FORCE ON IMPLEMENTING FINANCIAL SECTOR RESOLUTION

Introduction

Financial market infrastructures (FMIs) are the backbone of the financial system: they enable market participants to transact with one another in an efficient manner. FMIs are inherently systemic, as their very names imply: payments systems, securities settlement systems (SSSs) and central counterparties (CCPs).¹ If an FMI were to cease operation, it could put a stop to payments and/or securities and derivatives transactions. That in turn could destabilise financial markets and possibly the economy at large.

In effect, FMIs are ‘single points of failure’: they reduce risk as long as they remain robust, but they concentrate risk and serve as a conduit for contagion if they fail. Moreover, the risks posed by FMIs are highly correlated. Each G-SIB is generally a member of several FMIs (see Annex 1), so if a G-SIB enters resolution many or all FMIs may come under pressure at the same time.

Two responses are in order: first, to make FMIs less likely to require resolution; and, second to improve the resolution regime applicable to FMIs. Considerable progress has been made with respect to the first item. As a result of post-crisis reforms to regulation and supervision, the G-SIBs that are the most significant FMI participants are much less likely to fail. And, thanks to resolution reform, if such a G-SIB were to fail, there is a much greater likelihood that the bank can be stabilised and restructured without taxpayer support. Even if a participant does default on its obligations to an FMI, this does not imply that the FMI itself will enter resolution. For example, under EMIR, CCPs are required to be able to withstand the simultaneous default of their two largest counterparties (‘Cover 2’).² So the failure of an FMI should be an extremely rare event, a ‘tail of the tail’ risk.

But it is an event that could conceivably occur, and if it did, it could have catastrophic consequences. It is therefore of the utmost importance that FMIs are resolvable, i.e. that each FMI can fail, be restructured and resume operations, all without receiving taxpayer support.³ To this end the FSB has developed key attributes for an effective resolution regime for FMIs; the FSB and the European Commission are now considering legislation that would implement

¹ Note that FMIs also include central securities depositories and trade depositories. For an overview of FMIs see CPSS-IOSCO (2012) *Principles for Financial Market Infrastructures*. In the United States, the Financial Stability Oversight Council (FSOC) has designated a number of financial market utilities as systemic and subjected these to enhanced oversight and supervision. See FSOC (2012).

² Note that under CPSS-IOSCO (2012), ‘Cover 2’ is required for CCPs either involved in riskier activities or systemically important in multiple jurisdictions. All other CCPs should maintain sufficient financial resources to cover potential losses, including the default of the counterparty with which the CCPs have the largest credit exposure (‘Cover 1’).

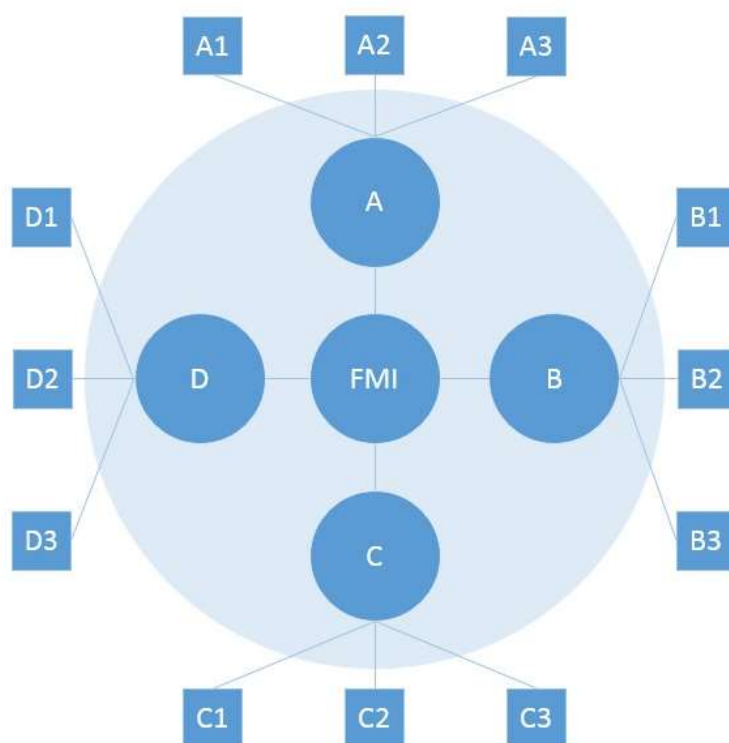
³ Theoretically, if one FMI fails, market participants could shift to another or start a new one. That could be enough to create continuity. Practically, however, such substitutability is extremely difficult to achieve, particularly under stressed market conditions and within the compressed timeframe necessary to maintain financial stability.

such attributes for FMIs in the EU. This will require that FMIs prepare recovery plans⁴ and that relevant authorities prepare resolution plans.⁵ This report highlights the issues that such plans should consider and outlines some options for how the plans might address them.

1. FMI basics

Before delving into the complexities of FMI recovery and resolution, it might be helpful to provide a brief overview of how FMIs operate. In general, FMIs are structured on a hub and spoke principle (see Figure 1), with the FMI at the centre. Each spoke has two stages: the first contains the members in the FMI (e.g. member A). From each of the members spokes extend in turn to their clients. As a result, any client of an FMI member can transact with any client of any other member of the FMI.

Figure 1. FMIs are hub and spoke organisations



Even this brief description throws up some key issues. The first concerns the role of the FMI itself. Does it merely provide technology (e.g. to enable participants to calculate their obligations to one another and settle mutual obligations)? Or does the FMI interpose itself as counterparty between the clearing members, assuming financial risk?

If the FMI is merely a technology or service provider, operational continuity is the principal concern. The failure of an FMI member is unlikely to pose an immediate threat to the FMI. Although the FMI can itself go bankrupt, it should be possible for the administrator to continue

⁴ CPMI-IOSCO (2015) sets out the standards for FMI recovery plans.

⁵ FSB (2014 – pp. 57-74) sets out standards for FMI resolution plans.

to operate the technology so that the FMI may continue to provide the core services (as the actual settlement occurs off the balance sheet of the FMI).

By contrast, if the FMI interposes itself as counterparty between the clearing members, then the failure of the FMI may make it impossible for the FMI to continue operations. Recovery and resolution plans for the FMI aim to prevent such a disruption, and these are the principal concerns of this report.

The second issue concerns the point at which and the terms on which a transaction (and the associated liability) passes from the 'sending' clearing member to the FMI and from the FMI to the 'receiving' clearing member. In general, FMIs are organised on the principle that transactions sent to the FMI are irrevocable as soon as they pass validation and conditionality checks, or pass milestones set in the FMI's rules and are accepted by the FMI (sender finality). Upon acceptance of the sender's instruction, or at a defined point in accordance with its rules, the FMI credits the receiver. At this point the transaction becomes final and unconditional (receiver or settlement finality).⁶

In some cases a transaction sent to the FMI is contingent on the sender's receiving a transaction of equal value from the recipient via the FMI. For example, in securities settlement systems, transactions are generally on a 'delivery versus payment' basis. The FMI will only deliver securities to the buyer and funds to the seller if it has received funds from the buyer (for delivery to the seller) and securities from the seller (for delivery to the buyer).

The third issue concerns the interval between the transaction or trade date and the value date on which final settlement occurs through the FMI. Although considerable compression between trade and settlement dates has already occurred, an interval remains for some transactions, especially in securities, so that some transactions may be 'in flight' if a participant fails.⁷ FMI rules must clearly state how such transactions should be handled, and this treatment should be reflected in the resolution plans for both the FMI and its participants.

The fourth issue concerns the ownership of FMIs. Some FMIs are owned and operated by public authorities, such as central banks. Others are private entities, either mutually owned by the clearing members or separately owned by third parties (some of whom may be publicly listed and traded). The ownership structure shapes incentives; it gives rise to governance issues and may affect competition. That in turn will have a bearing on recovery and resolution for the FMI.⁸

This report deals principally with the resolution of private-entity FMIs. We assume that the public authorities will ensure that the FMIs under their ownership and operation (e.g. central bank payment systems such as TARGET) remain robust at all times. In this report we deal

⁶ Within the EU this issue is very clearly regulated by the Settlement Finality Directive (2009/44/EC) and Directive 2002/47/EC on financial collateral arrangements (CPSS-IOSCO, 2012, pp. 64-66).

⁷ Practice in this area varies considerably. In real time gross settlement payment systems the interval between transaction initiation and transaction finality is effectively zero. This eliminates the possibility of in-flight transactions and reduces risk to the sender and receiver. In addition, in RTGS systems operated by central banks, the FMI (i.e. the central bank) generally guarantees the payments initiated over the system so that the receiver is protected against the failure of the sender. By contrast, in many securities settlement systems, there is an interval of at least one business day between the trade date and the settlement date. Although delivery versus payment (DVP) reduces settlement and counterparty risk to the seller and to the buyer, both the seller and the buyer effectively have replacement risk, if the buyer fails to pay or the seller fails to deliver.

⁸ For a discussion with respect to central bank FMIs see (CPMI-IOSCO, 2015).

mainly with potential or actual failure of private-entity FMIs due to i) the failure of one or more participants in the FMI; and ii) the failure of the FMI itself (whilst each of its members remains in good condition).⁹ Furthermore, we focus on payment systems, securities settlement systems and central counterparties, especially for derivative transactions.

2. Key attributes of effective resolution regimes for FMIs

The FSB has developed a set of key attributes for effective resolution regimes for FMIs (FSB, 2014). This adapts the key attributes developed in connection with bank resolution to the business of an FMI. This is fairly straightforward for most attributes. Three problems pose difficulties, however: the need for coordination between resolution at the failed bank and recovery/resolution at the FMI; the dividing line between recovery and resolution at the FMI and the ultimate objective the FMI resolution should seek to achieve: continuity or closure.

The similarities to the key attributes for banks relate to i) the need for the *FMI* to develop a recovery plan as well as ii) the need for *jurisdictions* to: designate a resolution authority for the FMI; endow that authority with certain powers; and mandate that the authority develop a resolution plan for the FMI.

In particular, resolution regimes for FMIs should mandate that FMIs engage in ongoing recovery planning as well as ongoing resolution planning. The recovery plan should demonstrate that the FMI would remain viable if a participant defaults (in the case of a CCP, it should remain viable, even if its largest or two of its largest clearing members were to fail at the same time).¹⁰

To prepare for the possibility that the FMI may not be able to recover (so that resolution is required), jurisdictions should designate a resolution authority for each FMI. This authority should be empowered to act as or appoint an administrator or conservator to resolve the FMI (should it become necessary to do so) in cooperation with central banks and other authorities.¹¹ The resolution regime should provide the resolution authority with a complete kit of resolution tools so that the resolution authority has

- the power and the capacity to ensure the continued provision of the critical functions of an FMI in resolution and to fulfil the FMI's payment and settlement obligations on time, including on the day that the FMI enters into resolution, until the FMI is restored to viability or those functions transferred, replaced by another provider or wound down in an orderly manner.¹²

The tool kit should include the power (subject to a 'no creditor worse off' [than in liquidation] safeguard)¹³ to allocate losses and to allocate or terminate contracts, to transfer the FMI's

⁹ Note that the FMI can also fail due to operational or technical reasons external (e.g. earthquakes, power failures, hacking) or internal to the FMI (e.g. defect in FMI's software).

¹⁰ In particular, FMI recovery plans (especially the need for a sound risk management framework) should be consistent with the CPSS-IOSCO (2012) and take into account the guidance in the CPMI-IOSCO (2014) report on *Recovery of financial market infrastructures*.

¹¹ FSB (2014, pp. 59-60)

¹² Note that the FMI may need to have access to liquidity in order to meet payment and settlement obligations on time. The Key Attributes document is silent as to where the FMI might obtain such liquidity, if needed (FSB, 2014, p. 62).

¹³ Note, however, that this safeguard may be difficult to implement, especially in the case of CCPs, as it may require estimates of the proceeds that a clearing member could have realised, if recourse were

critical functions to a solvent third party or bridge institution and to impose a moratorium on payments to general creditors.¹⁴ In addition, steps should be taken to assure that the entry of the FMI into resolution does not automatically trigger participants' rights to terminate or close out their contracts with the FMI.¹⁵ At a minimum, the resolution authority for the FMI should be given the power to impose a stay on the ability of participants to exercise such rights solely on the grounds that the FMI entered resolution.¹⁶

Furthermore, the FSB recommends that jurisdictions consider establishing a Resolution Fund to facilitate the resolution of FMIs, similar to the resolution fund established for banks. This would be in addition to any default fund established by the FMI itself. If this Resolution Fund has access to funding from the government, care should be taken to ensure that taxpayers suffer no loss in connection with such funding. If necessary to repay the government in full, the Resolution Fund should be able to levy the FMI, its creditors (including FMI participants) or, as a last resort, participants in the financial system as a whole.¹⁷

Finally, jurisdictions should mandate that the resolution authority develop a resolution plan for the FMI. The resolution plan should contemplate scenarios where

- the FMI has already implemented loss-sharing arrangements and exhausted any default fund;
- there may be no existing alternative provider to which the resolution authority might transfer the critical economic functions of the failed FMI; and/or
- there may be obstacles to resolution and/or to the ability of the FMI to execute its recovery plan.¹⁸

The resolution plan should take systemic effects (e.g. on participants as well as on markets and on other FMIs) into account as well as identify and implement appropriate reporting, disclosure and information-sharing arrangements with participants, other FMIs, authorities in other relevant jurisdictions and the market as a whole.¹⁹

The entry of an FMI into resolution poses significant problems. According to the FSB, resolution should be initiated if the FMI "is, or is likely to be no longer viable ... and has no reasonable prospect of returning to viability within a reasonable timeframe".²⁰ In particular, entry into resolution should be possible, if the FMI's recovery plan has failed, or is likely to fail, to restore the FMI to viability.²¹ But these are quite general principles. To put the principles

made to tear-ups or other market-wide measures at a time of severe stress in financial markets. For further discussion, see (Gracie, 2015).

¹⁴ However, such a moratorium should not extend to payments due by the FMI to its participants or to any linked FMI (FSB, 2014, pp. 62-64).

¹⁵ FSB (2014, p. 65).

¹⁶ However, participants would be able to exercise such rights, if the FMI were to fail to make cash payments when due (FSB, 2014, p. 65).

¹⁷ Note that the person(s) among the creditor hierarchy of FMIs to bear the cost of resolution remains a highly controversial question. This has so far been a major impediment to the development of final international standards and regulations for CCP resolution (FSB, 2014, p. 65).

¹⁸ Such obstacles may include deficiencies in service agreements, collateral arrangements, legal agreements, netting arrangements and/or liquidity provision (FSB, 2014, pp. 68-69).

¹⁹ Ibid. pp. 69-70.

²⁰ Ibid. pp. 64-65.

²¹ Ibid. p. 65. In particular, entry into resolution should be possible, if

into practice, three problems must be solved, particularly when the threat to the FMI emanates from the failure of one of the FMI's clearing members.

The first is interconnection between resolution of a failed participant and recovery/resolution at the FMIs in which the failed participant participates. As outlined in the 1st Interim Report, if the failed participant is a bank, it will – under certain resolution plans – be able to continue to meet its obligations to the FMI. If so, the FMI need not even start its recovery process. By contrast, if the FMI takes the entry into resolution as the occasion to terminate its contracts with the failed bank and end the failed bank's access to the FMI, the FMI may prevent the stabilisation of the failed bank and trigger the need for the FMI itself to initiate recovery and possibly resolution procedures. So coordination in both planning for and executing resolution can benefit both the failed bank and the FMI.

The need for such coordination is acute and can arise suddenly, because failing to meet an obligation to an FMI may indicate that the bank has reached the point of non-viability.²² In the event that a clearing member cannot pay the amount that it owes at the deadline for settlement, the FMI will generally provide a short grace period to the member to enable it to cure the default. If the member cannot immediately draw upon own resources to make the payment directly, the member may appeal to the central bank (if it has access to central bank facilities) to provide it with the liquidity that the member needs in order to meet its obligation to the FMI. The central bank must make a quick assessment as to whether the member:

- is fundamentally in sound condition, but temporarily illiquid. In this case, it will generally be sensible for the central bank to extend credit to the member against the pledge of sound collateral, as this will avoid putting either the member or the FMI into resolution.
- has reached the point of non-viability (and is therefore likely to enter resolution), but is likely to be able to be stabilised via bail-in of “reserve capital”²³ only. In this case, it will generally be sensible for the central bank to extend credit to the member against the pledge of unencumbered assets, as this will enable the FMI to settle, restrict resolution to the failed bank (and facilitate the bank-in-resolution's continued access to the payments system) and limit contagion.
- has reached the point of non-viability (and is therefore likely to enter resolution), but is not likely to be stabilised via the bail-in of reserve capital. In this case, it may make sense for the central bank to refrain from extending credit immediately to the bank in resolution, and have the FMI implement its recovery plan.

The central bank will also need to consider the knock-on effects of this decision, however. These can be quite significant, especially where the member failing to meet its obligation is a

-
- i. recovery measures available to the FMI, including the use of its available assets and default resources and the application of any loss allocation rules, are exhausted and have failed to return the FMI to viability and continuing compliance with applicable legal and regulatory requirements, or are not being implemented in a timely manner; or
 - ii. the relevant oversight, supervisory or resolution authority determines that the recovery measures available to the FMI are not likely to return the FMI to viability within the timeframe required to enable continued compliance with applicable legal and regulatory requirements, or that they are otherwise likely to compromise financial stability.

²² To assure that banks are monitoring their liquidity situation properly, supervisors have mandated that banks improve their intra-day liquidity reporting. For details, see BCBS (2013).

²³ By ‘reserve capital’ we mean instruments other than CET1 capital that qualify as TLAC (e.g. AT1 and Tier 2 capital as well as qualifying senior debt).

G-SIB, for such institutions tend to be clearing members and settlement agents in most of the principal FMIs (see Annex 1). Thus, the failure of a G-SIB is likely to put pressure on several FMIs at the same time.

Without receipt of payment from the bank entering resolution, each of the FMIs in which the bank-in-resolution is a member may have to initiate its recovery plan and in an extreme case, may find it difficult to make payments as scheduled to the other clearing members. If one or more of these FMIs does not pay on schedule, contagion could occur: one or more of the other clearing members that had been expecting a payment from the FMI could themselves encounter a liquidity shortfall. Consequently, central bank(s) should consider whether (and on what terms) they would provide credit to the FMI and/or to its non-defaulting clearing members.

Given the interconnections between FMIs and G-SIBs the maintenance of financial stability requires coordination and cooperation:

- among the supervisor, resolution authority and central bank of the FMI; and
- between the authorities (supervisor, resolution authority, central bank) responsible for each of the clearing members and the authorities responsible for the FMI.

This is a formidable challenge. It is even more so if supervision or resolution is assigned to a college that itself has to reach a collective decision before it can interact with other authorities (as is the case for FMIs in the EU under EMIR).

The second problem concerns the dividing line between recovery and resolution. At what point should resolution start and control pass from the FMI to the resolution authority of the FMI? Once control passes to the resolution authority, should the resolution authority be bound by the rules of the FMI? This is quite a significant question, especially with respect to central counterparties.²⁴

The third problem concerns the objective that resolution should aim to achieve: continuity or closure. The FSB's Key Attributes allows for both:

An effective resolution regime for FMIs should pursue financial stability and allow for the continuity of critical FMI functions without exposing taxpayers to loss, *either by restoring the ability of the FMI to perform those functions as a going concern or ensuring the performance of those functions by another entity or arrangement coupled with the orderly wind-down of the FMI in resolution.*²⁵

In practice, resolution plans must choose one objective or the other, and the actions required will differ according to the objective chosen. This is especially relevant in the case of central counterparties.

We now turn to a discussion of resolution at each type of FMI.

²⁴ For discussion, see (FSB 2016, pp. 14-15).

²⁵ Emphasis added. When pursuing closure as the objective of resolution, note that it may be difficult to transfer the functions of a large CCP due to the capital and operational requirement that would thereby be imposed on the transferee CCP. Also, when they are not multiple, robust CCPs that would make transfer of all products a realistic possibility, closure of CCP may no longer be a viable option (FSB, 2014, p. 58).

3. Resolution of payment systems

Payment systems are crucial to the operation of a modern economy.²⁶ There are both public (government-owned) and private payment systems (see Table 1 for examples). Here we focus on issues relating to the resolution of private payment systems, on the rationale that systems owned and operated by governments or central banks cannot fail for financial reasons and will therefore not require resolution.²⁷

Table 1. Payment systems

Government/central bank systems		Private systems	
TARGET	RTGS system owned and operated by ECB	EURO 1 EBA Clearing	RTGS-equivalent net settlement system
FEDWIRE	RTGS system owned and operated by Federal Reserve	CHIPS	RTGS-equivalent net settlement system operated by The Clearing House

Private payment systems generally act as a technology provider. In such cases, the role of the payment system is restricted to calculating the net amount that each participant is due to pay or receive at the point of settlement. The actual settlement occurs on the books of the central bank, via special purpose zero-balance accounts. The system itself is not counterparty to the participating banks and has no direct exposure to the failure of a participating bank.

Law and regulation as well as the rules of the private payment systems limit systemic risk. Large-value payment systems have generally eliminated or severely restricted overdrafts to sending members. Systems only accept payment instructions from clearing members if the sender has sufficient funds in its reserve account in order to cover the payment at settlement, and the system either immediately debits the sender’s reserve account or places a hold on the account for the amount due at settlement. Payments sent into the system are final and irrevocable (sender finality) as soon as the system accepts the payment.

Moreover, payments settle very quickly. Indeed, the principal high-value payments systems settle immediately in real time. For those systems settling on a deferred net settlement basis, settlement now occurs at frequent intervals during the business day and at the latest at the end of the business day on which the payment is initiated. Finally, payments received from the system are final, as soon as the system credits the amount to the bank of the beneficiary (receiver finality). Together, these arrangements assure that receiving banks are insulated from the failure of sending banks and that the payment system itself is robust (able to withstand the simultaneous failure of two of its largest participants).

4. Resolution of foreign exchange and securities settlement systems

Foreign exchange settlement systems facilitate the completion of foreign exchange transactions. Securities settlement systems (SSSs) transfer ownership of securities from the

²⁶ For a discussion of payments systems see (CPSS-IOSCO, 2012, pp. 148-151)

²⁷ In addition, central banks generally guarantee any payment accepted into the system, so that the receiving bank is not exposed to the risk that the sending bank will fail.

seller to the buyer.²⁸ Without such systems, neither securities nor foreign exchange markets can function efficiently. Assuring that such systems are robust is therefore vital to the maintenance of financial stability.

As noted above, foreign exchange and securities settlement systems are intertwined with payment systems. These are used to effect the cash payments due under foreign exchange transactions as well as the cash leg of securities transactions. As we did with payments systems, we focus on private systems either mutually owned by their members or by third parties. We assume, for the purpose of this report, that government-owned systems cannot fail, and will therefore not require resolution.²⁹

4.1 The basics of FX settlement

Foreign exchange settles on a conditional basis. The seller delivers the currency (foreign exchange) sold to the buyer via a payment in that currency into the buyer's account at the central bank for that currency, whilst the buyer pays 'domestic' currency into the seller's account at the 'domestic' central bank. Hence, the settlement is payment versus payment (PVP). The role of the foreign exchange settlement system is to calculate the amounts parties are due to pay and due to receive, to monitor that the parties actually make the payments when due, and release the payments to their beneficiaries if and only if it can verify that the parties have actually made the required payments.³⁰

4.2 The basics of securities settlement

Securities settlement for equities and bonds occurs within the broader framework of securities markets administration principally provided by central security depositories,³¹ supplemented by registrars, issuing and paying agents and custodians. This framework does three things:

1. It reconciles the amount of each security outstanding with the amount issued (taking into account the effect of corporate actions, redemptions and new issues).
2. It safeguards, immobilises and dematerialises securities so that they may be traded in electronic form.
3. It records the ownership of outstanding securities and provides for the segregation of client assets.

When a security is sold, the buyer and seller first need to confirm the details of the security sold, the number of units sold, the price at which the sale will take place, the identity of the buyer and seller and the settlement instructions (sometimes called 'matching'). Settlement then follows: the transfer of securities from the seller's account to the buyer's account at the SSS. The sale process is complete, and the obligation of the buyer and seller to each other is

²⁸ For a discussion of securities settlement systems see CPSS-IOSCO (2012, pp. 152-55). The analysis presented here is also relevant to foreign exchange settlement systems that settle on a payment versus payment (PVP) basis. For further details see (CLS, 2016).

²⁹ This is the path that governments have generally elected to take with respect to government bonds, and it is the path that the ECB has elected to take via the formation of Target 2 for securities.

³⁰ For a further explanation see CLS (2016). Note that CLS now plays a fundamental role in the FX market by providing PVP settlement services of 18 currencies among its 66 members. However, FX transactions not covered by CLS have much higher exposure to settlement risks.

³¹ For a description of activities and risks of CSDs see CPSS-IOSCO (2012, pp. 64-66). Note that in some cases the CSD may act as custodian and/or registrar. It may own and/or operate the securities settlement system. The CSD may also engage in securities lending, either as principal or agent.

discharged only when the transfer is final in accordance with the SSS's rules (i.e. unconditional and irrevocable).

For most securities there is an interval between the trade and settlement dates. This creates some risk that either the buyer or seller will fail before the settlement becomes final.³² Shortening the interval (in the European Union the CSD Regulation has harmonised this at two days [T+2]) therefore reduces settlement risk. So does the requirement (contained in MiFID 2) that all securities transacted on trading platforms be centrally cleared.

In most cases, SSSs transfer securities on a delivery-versus-payment (DVP) basis so that the SSS delivers the sold securities to the buyer, if and only if the buyer delivers the requisite amount of funds to the SSS for the account of the seller. Strictly speaking, under DVP the SSS has no direct exposure to either the buyer or the seller. Securities remain the property of the seller, and funds the property of the buyer, until such time as the DVP transaction becomes final (irrevocable and unconditional). The SSS is not counterparty to either the seller or the buyer; it merely facilitates the process by which the buyer and seller can settle their obligations to one another. Correspondingly, the SSS itself should not be threatened by the failure of either the buyer or seller.³³

5. Resolution of central counterparties

With respect to futures and derivatives, central counterparties (CCPs)³⁴ clear all exchange-traded products³⁵ as well as a growing range of standardised OTC products (FSB, 2015b). Greater use of central counterparties in connection with derivatives is one of the principal tenets of the financial reform programme enacted since 2008. Indeed, the authorities have made clearing through CCPs for standardised products, such as interest rate swaps and credit derivatives, mandatory.³⁶ To facilitate the shift of OTC derivatives to central clearing, the Basel

³² In the EU, the Regulation on Settlement and Central Securities Depositories (CSDR) sets out the uniform obligations for the settlements of financial instruments and requirements for the organisation and conduct of central securities depositories (CSDs). In particular, in addressing settlement failures, it imposes a mandatory buy-in process that should be initiated when financial instruments are not delivered by the failing participant within 4 business days of the intended settlement date (Art. 7).

³³ However, a CSD affiliated with the SSS could be adversely affected, if, in the course of providing participants with ancillary services such as custody and securities lending, the CSD had

- lent securities as principal to the seller to enable the seller to meet its delivery obligation;
- lent cash to the buyer to meet its payment obligation (subject to the quality of any collateral); or
- guaranteed the performance of the seller and/or buyer.

However, the CSDR requires the CSD to ring-fence the SSS. The CSDR also specifies the group of CSDs that provide banking-type ancillary services and details the requirements for its authorisation, including additional capital surcharge and an adequate recovery plan to ensure continuity of CSDs critical functions in situations when liquidity or credit risk crystallises as a result of conducting banking-type business.

³⁴ For an overview of CCPs see Norman (2011).

³⁵ This includes all securities and repos based on securities collateral. According to ICMA's most recent semi-annual European Repo Market Survey (conducted June 2015), around 27% of outstanding repos by value are cleared through a central clearing counterparty (ICMA, 2015).

³⁶ However, coordination problems arise due to the disjointed implementation process for designating derivatives subject to central clearing, the counterparties to which the requirement applies, and the CCPs that the counterparties may use to fulfil the mandatory clearing requirement.

III Accord differentiated between cleared and uncleared derivatives, imposing a higher capital charge on the latter.³⁷ As a result, CCPs clear an increasing proportion of total derivative transactions.³⁸ Correspondingly, it is increasingly important that CCPs be resolvable.³⁹

5.1 The basics of CCPs

CCPs both transfer and mutualise risk. Although risk transfer was the primary motivation for imposing mandatory clearing, most CCPs would regard themselves principally as system operators that facilitate the mutualisation of risk among the market participants who choose to act as clearing members.⁴⁰ Accordingly in the CCP business model, the CCP operator should hold resources to protect against operational and business risks and, if necessary, to manage an orderly wind-down. In the eyes of most CCPs (but not their members!) the CCP itself should not be accountable for losses arising from member default: that should be the responsibility of the clearing members in accordance with the rules of the CCP.

A CCP becomes principal to all trades with its clearing members. The CCP is a buyer to every seller and a seller to every buyer. CCPs predominantly use two methods to effect this transformation. Both novation⁴¹ and open offer⁴² provide market participants with the legal

³⁷ Effective 1 January 2017, final standards for the capital requirements of CCP-cleared transactions will come into force. Banks' default fund contributions to QCCPs will then be calculated based on a risk-sensitive formula, while at the same time all capital charges on banks' exposures to qualifying CCPs (including both trade exposures and default fund contributions) are capped so that the total amount will not exceed the sum applied to transactions with non-qualifying CCPs. A qualifying CCP is defined as "an entity that is licensed to operate as a CCP (including a license granted by way of confirming an exemption), and is permitted by the appropriate regulator/overseer to operate as such with respect to the products offered" (BCBS, 2014).

³⁸ 65% of interest rate derivatives were centrally cleared at mid-year 2015, up from 50% at year-end 2011 SIFMA Statistics. For credit derivatives 60 to 80% of new transactions in the US are eligible for central clearing; 40 to 60% in the EU. And, for commodity, equity and foreign exchange derivatives less than 20% of new transactions can be centrally cleared in most jurisdictions. See FSB (2015a).

³⁹ For discussion of resolution of CCPs see (FSB 2016), Gracie (2015), Duffie (2015), Tucker (2013) and Wendt (2015).

⁴⁰ As summarised by LCH, "By acting as the buyer to every seller and the seller to every buyer, CCPs reduce counterparty risk, absorb shocks and help to prevent the build-up of excessive risk in the financial system." However, the CCP itself is "essentially a risk management system through which [the members] can mitigate their counterparty risk and benefit from other services; e.g., portfolio compression. The CCP operator is responsible for the design and functioning of this system, and primarily has operational and business risks."

⁴¹ Through novation, the original contract between the buyer and seller is terminated and simultaneously replaced by two new contracts that have come into existence, i.e., one between CCP and the buyer and the other between CCP and the seller, so that CCP assumes the original buyer and seller's contractual obligations to each other. Novation is appropriate when a binding contractual relationship already exists between the original buyer and seller at the moment the transaction details are registered and matched in the trading system, and hence in order for a counterparty to function, the original obligations need to be extinguished.

⁴² Where all pre-agreed conditions are met, a CCP extends an open offer to act as a counterparty to market participants and is therefore automatically and immediately interposed in a transaction the moment a trade is executed. Compared with novation, in an open-offer system the buyer and seller never have a contractual relationship as CCP steps in at the exact point that matching occurs.

certainty that CCP is obligated to effect the transaction.⁴³ As a result, for transactions cleared via the CCP the buyer and seller have no exposure to one another. Instead, they each have exposure to the CCP.

In aggregate, CCPs achieve very significant risk reduction. This occurs in two stages. The first (bilateral) stage effectively interposes the CCP as counterparty between the two market participants A and B, so that each has an exposure to the CCP rather than to each other (see Box 1).

Box 1. How CCPs work

CCPs can be deconstructed into two stages: bilateral and multilateral. In the bilateral stage, the CCP has only two clearing members, A and B. These two clearing members novate the bilateral OTC contracts that they make with one another to the CCP so that A and B have no direct exposure to one another, but are each exposed to the CCP. If A was due to have made a payment to B, this payment is now due to the CCP, and the CCP becomes due to make the payment to B.

Figure 2. CCP Bilateral Stage: Novation transfers obligation from counterparty to CCP

Figure 3. CCP Multilateral Stage: Netting reduces exposure but mutualises risk

		Due from			
		A	B	C	CCP
Due to	A	0	10	-5	5
	B	-10	0	15	5
	C	5	-15	0	-10
	CCP	-5	-5	10	0

⁴³ The open offer method is derived from the English case law that a binding contract can be achieved if one party (the CCP) states openly that it is willing to be contractually bound if the other party (either the original buyer or seller) performs certain acts (Turing, 2012). Other legal mechanisms that also allow CCPs to guarantee obligations include explicit and legally binding settlement guarantees, i.e., a transaction agreement that indicates the technical counterparty while the CCP will be liable in the case of counterparty default (non-payment of amounts due on the transaction settlement date).

The second (multilateral) stage mutualises risk. It effectively nets the payments that clearing member A is due to pay to or receive from each of the other clearing members into a single net payment that clearing member is either due to pay to or receive from the CCP. This single net exposure is likely to be considerably less than the aggregate bilateral counterparty exposures that clearing members would have incurred had the derivatives not been cleared (see Box 1).

Clearing member default is the principal risk facing the CCP.⁴⁴ If a clearing member fails to meet its obligations to the CCP, the CCP may experience a liquidity and/or capital shortfall. Operational risk at the CCP may increase, if the failed member provided payments, settlement and/or custody services to the CCP. The CCP (and/or its default fund) may also incur losses, if it invests in obligations of the failed member.

CCPs limit their own risk principally through the requirement that clearing members post initial and variation margin. CCPs monitor their risk exposures and have the power to call for additional margin and, in extreme cases, restrict members to conducting risk-reducing transactions. In addition, CCPs impose strict criteria for the admission of clearing members and set standards for transaction acceptance.⁴⁵ This effectively ensures that – for all but the most extreme cases – the clearing member itself will bear the loss that its default may cause. To handle such extreme cases, CCPs require clearing members to contribute to a default fund.

CCPs have clear rules regarding how they will manage default by a clearing member. The default management process starts with a determination by the CCP that the member is in default. This need not be automatic: under the rules of most CCPs, the CCP must take a decision to do so – a fact that is conducive to allowing for the resolution process at the clearing member to recapitalise the bank-in-resolution and effectively cure the default so that the CCP

⁴⁴ Overall, CCPs face four types of risk: market, credit, liquidity and operational risk. Under business as usual conditions, the CCP incurs practically no market risk. Similarly, under business as usual conditions CCPs face limited liquidity risks. Payments to counterparties (outflows) should be balanced by payments from counterparties (inflows) so that net outflows are zero. Operational risk for a CCP is on a par with the operational risk incurred in major banks' trading businesses. Indeed, given the CCP's focus on a limited number of standardised contracts, the CCP may actually incur a much lower level of operational risk.

⁴⁵ CCPs reserve the right to refuse to accept transactions from members who fail – in the eyes of the CCP – to fulfil the CCP's membership requirements. In addition, CCPs reserve the right to liquidate a clearing member's positions at its (the CCP's) own discretion, and/or to restrict the access of the clearing member to the CCP.

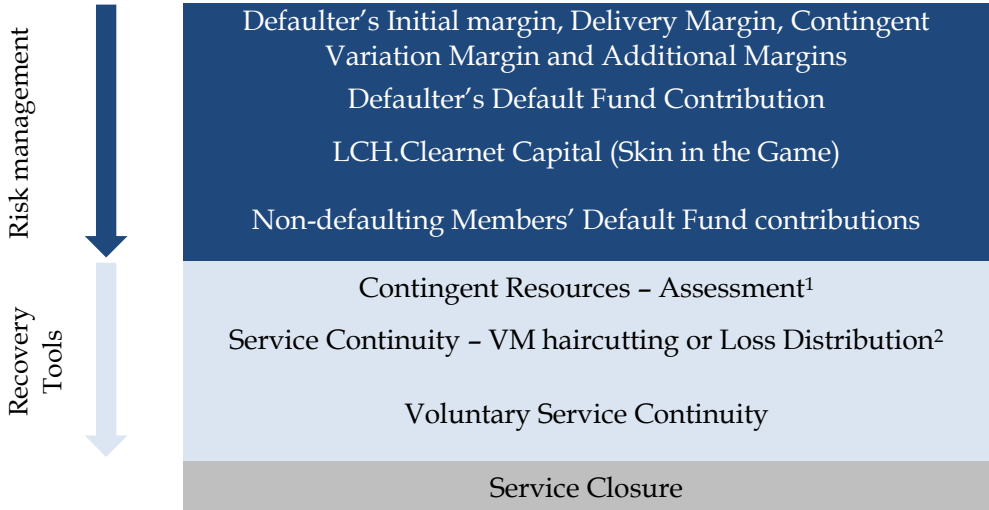
Again, this could have significant implications in the event of a failing G-SIB by accelerating the slide of G-SIB toward the PONV. Also, if CCP excludes a member temporarily or permanently to new transactions, how could the member continue fulfilling its mandatory clearing obligation, especially when transactions cannot feasibly be transferred to another CCP for clearing or be cleared via a surviving clearing member? Even if the member were to receive a waiver from mandatory clearing, would it then trigger higher capital requirements for the non-centrally cleared OTC transactions? Note also that BRRD empowers the resolution authorities to temporarily suspend the termination rights of any party (except central banks and CCPs [BRRD Art. 71(3)]) to a contract with banks that have entered resolution. Proportionate restrictions could be imposed on counterparties' rights to close out, accelerate or otherwise terminate financial contracts to effectively apply the resolution tools. This could create considerable concerns for CCPs.

need not start its recovery process and need not initiate the default waterfall process at all (see section 5.3, below).⁴⁶

If the CCP does declare the member to be in default, the defaulting member will generally not be able to conduct new transactions, and the CCP will close out the positions of the defaulting participant. This leaves the CCP with an unmatched book – it retains open positions equal and opposite to those the CCP had held vis-à-vis the defaulting member. In order to rebalance its portfolio (and return to a matched book) the CCP will conduct an auction of its open positions among the non-defaulting participants. Effectively, the CCP closes out the clearing member’s position vis-à-vis the CCP at its actual replacement cost.

Such an auction may take time and/or may fail to rebalance the CCP’s portfolio, however. If so, the CCP may incur losses and/or have difficulty in making payments to non-defaulting participants.

Figure 4. CCP loss-allocation waterfall



¹ Callable up to the value of each member’s Default Fund contribution at the time of the default.
² The resources available in the service continuity phase are determined by the LCH Clearnet Rulebooks.
 Source: CCP Risk Management Recovery & Resolution: An LCH White Paper.

To the extent that the close-out process generates a loss, this loss is allocated according to a pre-agreed ‘waterfall’ (see Figure 4) in line with the requirements established under EMIR.⁴⁷ Its key principle is ‘defaulter pays’: losses are first by resources posted by the defaulting clearing member (starting with defaulter’s initial margin, then its variation margin and finally its contribution to the CCP’s default fund).

Any loss in excess of this amount is next allocated to the CCP itself up to the amount of the ‘skin in the game’ contribution that the CCP is required to make to the default fund (for CCPs within the EU this is governed by EMIR). The amount drawn against this tranche is effectively the CCP’s loss on default of the failed clearing member(s). If losses still require

⁴⁶ Note that according to the recent CPMI-IOSCO Level 3 assessment, CCPs generally have significant discretion in determining when to declare a clearing member default, and less discretion regarding how to apply resources in default waterfalls (CPMI-IOSCO, 2016, p.88)
⁴⁷ For a general discussion of loss allocation rules at CCPs, see Elliott (2013).

allocation/absorption, the waterfall then lands on the contributions of the non-defaulting members to the default fund.

If losses incurred in the close-out process could not be fully covered by pre-funded resources in the default waterfall, CCPs generally have the ability to assess clearing members for additional contributions ('Powers of assessments' or 'unfunded default fund contributions'). In most cases CCP also places a cap on such assessments, although the amount, structure and duration of these caps vary considerably among CCPs themselves.⁴⁸

Upon a complete depletion of the default fund, CCPs will require surviving members to contribute resources in order to replenish the default fund.^{49 50} (And according to EMIR, CCPs in the EU are required to replenish their 'skin in the game' contribution to the default fund within a month.) If the default fund cannot be replenished immediately or the replenishment is insufficient to cover the losses resulting from the default of the failed counterparty, the CCP may resort to supplemental loss allocation methods (often mandatory and ex ante agreed) as clearly set out in its own rulebook or imposed by law and regulation, such as margin haircutting or contract tear-ups.⁵¹

Margin gains haircutting potentially enables the CCP to return to a balanced book, if the auction of the failed member's positions fails to do so. Under this approach the CCP would withhold some portion of the margin payment that it was due to pay to clearing members, whilst continuing to collect in full the payment of margin that was due from members. This can readily be done for variation margin (VM), as the payments due to the clearing member are obligations of the CCP, but not for the initial margin (IM) that clearing members had posted. Initial margin is the property of the clearing member (and of the underlying investment funds and clients of the clearing member) and is generally not accessible by the CCP without a specific contract to that effect. In the EU EMIR protects the IM that members and their clients post to the CCP. Unless the owner of the IM is itself in default, the IM may not be used to satisfy any obligations to third parties.

Tear-ups are a second supplemental method by which the CCP can return to a balanced book and stop losses that result from allowing the book to remain unbalanced.⁵² Under this option,

⁴⁸ See (CPMI-IOSCO, 2016, p. 96)

⁴⁹ For example, LCH has the ability to request contingent resources, i.e., additional contributions from the non-defaulting participants through its 'Assessment powers'. Non-defaulting Clearing Members may be obliged to make an Unfunded Contribution by reason of a 25% reduction in Default Fund for the first default. Following a first default, LCH may require subsequent Unfunded Contributions in respect of subsequent defaults provided Unfunded Contributions will not be payable in respect of any more than three defaults in any six-month period.

⁵⁰ CPMI-IOSCO (2016) observes that some CCPs do not clearly distinguish power of assessment for the purpose of loss allocation and for replenishment purposes, while others have separate rules for the two. This distinction also determines how the CCP caps the assessment it may make of each clearing member.

⁵¹ There might also be exceptions to this. For example, ICE Europe allows for a 'cooling off period' during which non-defaulting clearing members are not required to replenish the default fund and are given an assessment limit, so that they have more time to analyse position risks, locate funding to meet obligations, and execute any contingency plans. A cooling-off period commences at trigger event including a single default, and lasts for 30 days. It is, however, applied only to FX and F&O products but not CDS.

⁵² For a discussion of tear-ups, see Elliott (2013, p. 8)

the CCP closes out selected contracts from those remaining after the conclusion of the auction. The CCP rulebook determines the price at which the tear up will occur.

In sum, the CCP recovery process, together with CCP risk management, goes a very long way to make CCPs robust. But not all the way. Three areas continue to cause concern.

First, there is a very small probability – a tail of the tail risk – that the losses incurred by a CCP will exceed the amount of resources available under the ‘Cover 2’ calculation made by the CCP.

Second, there is a concern that the loss allocation process may not operate quickly enough to ensure that the CCP can continue to provide hedging capacity to non-defaulting clearing members and to the market at large the ‘Monday’ following the initiation of the CCP recovery procedures. If the CCP is unable to make payments as scheduled to non-defaulting members and/or their clients, this increases liquidity pressure on such clients. If delays in execution obscure pricing, this may heighten uncertainty at what is already likely to be a period of considerable stress in financial markets. Finally, if the CCP is not in a position to accept new transactions, members and the market at large may find it difficult to manage their risk, especially with respect to standardised contracts whose clearing is concentrated in a particular CCP. Even if banks were granted a temporary exemption from mandatory clearing, they would face operational challenges and possible increases in capital requirements, if they had to revert to bilateral clearing.

Third, there is some concern that the alternative loss allocation methods may themselves disrupt financial markets. In particular, variation margin gains haircutting (VMGH) shares losses unequally and unpredictably. It may also take time to fully absorb loss or be insufficient to absorb the losses incurred by the CCP (Duffie, 2015). This threatens contagion without providing the assurance that the CCP can continue its critical economic functions. Tear-ups (especially complete tear-ups) are likely to be extremely disruptive to financial markets and the economy as a whole, as a tear-up will cause some or all of the CCP’s clearing members to become unhedged at the same time, and require the clearing members as well as some of their clients to seek to rebalance their own books at a time when financial markets are already likely to be under considerable stress. CCPs are therefore advised to avoid using complete tear-up “to the extent practicable”.⁵³ Some CCPs state that applying tear-up as a recovery tool of last resort incentivises clearing participants to support other recovery actions.⁵⁴

5.2 Commission proposal regarding resolution of CCPs

The European Commission is planning to introduce legislation to govern the resolution of CCPs. It has not as yet tabled a formal proposal, but has informally circulated a ‘non-paper’ outlining the key provisions that a proposal might take.⁵⁵ According to this straw man the Commission’s proposal would build upon the provisions in EMIR governing the supervision

⁵³ See CPMI-IOSCO (2014, p. 27). According to the FSB, “A full tear-up of contracts is unlikely to be consistent with the objectives of continuity of critical clearing services and minimising contagion or instability. Even tools that do not require full tear-up may have financial stability implications that could be difficult to identify, measure and manage and therefore demand close consideration. The use of a tool such as partial tear-up may have implications for participants beyond replacement of contracts, including on netting sets.” (FSB 2016, p. 17).

⁵⁴ See CPMI-IOSCO (2016, p. 99)

⁵⁵ For a summary see European Commission, (2015). Note that the document is unofficial and not publicly available.

of CCPs as well as those requiring CCPs to develop and submit recovery plans.⁵⁶ The proposal aims to implement the FSB Key Attributes by adapting the BRRD to the functions and business model of a CCP.

The institutional arrangements closely follow those for banks under the BRRD. The legislation will require member states to designate a resolution authority for the CCP and equip the authority with “powers to undertake all the relevant preparatory and resolution actions”. Such powers would be harmonised across member states⁵⁷ and would include the authority to

- (i) sell the CCP’s entire or critical functions to a viable competitor,
- (ii) create a publicly controlled bridge CCP, and/or
- (iii) allocate losses and positions among clearing members.⁵⁸

The resolution authority would be empowered to use such powers singly or in combination based on its assessment of the specific facts and circumstances and the particular CCP in resolution.

The resolution authority would be mandated to develop a resolution plan for the CCP.⁵⁹ The resolution plan should

outline the resolution powers and tools which authorities would most likely employ in case a CCP meets the conditions for resolution, proportionate to and in full consideration of the business model, market share and systemic relevance of the CCP both in the jurisdiction in which it is established as well as in other member states and third countries.

The plan should recognise that the failure of the CCP could result either from a multiple member default or from non-default scenarios. Regarding public financial support, this should be restricted to central bank facilities on normal terms (assuming the CCP has access to such facilities).⁶⁰

The plan should be developed in conjunction with other relevant authorities. Although the plan would not be legally binding, the home country resolution authority should inform the other authorities if it decides to deviate from the plan. To facilitate such cooperation member states would be directed to establish resolution colleges under the chairmanship of the CCP’s home country resolution authority. This college shall be modelled on the supervisory college established under EMIR and shall include all relevant authorities.⁶¹

⁵⁶ OJ L 201 of 27.7.2012

(<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0648&from=EN>).

⁵⁷ European Commission (2015) p. 3

⁵⁸ European Commission (2015) p. 8.

⁵⁹ Ibid. pp. 5-6.

⁶⁰ Ibid. p. 6.

⁶¹ According to the Commission (EC 2015, pp. 3-4), members of the resolution college could include, in addition to the CCP’s resolution authority (which would act as Chair), “the competent authorities of the clearing members, CCPs, central securities depositories and trading venues present in the EMIR college, as well as the relevant central banks, and ESMA. In addition, other members could include, as appropriate, the resolution authorities of the clearing members whose competent authorities are members, if different, the relevant competent authority of any parent undertaking to which recovery plans could apply, any competent ministries afforded a specific role in the resolution of CCPs, and EBA.”

This is broadly in line with the FSB principles for cross-border effectiveness of resolution actions and the FSB 2015 CCP work plan to develop granular standards and guidance for CCP resolution planning, including cross-border coordination and mutual recognition of resolution actions (FSB, 2015c).

Regarding the entry of a CCP into resolution, the language of the legislative proposal closely follows that of the BRRD for banks:

Authorities could be able to place a CCP in resolution when it is (i) failing or likely to fail, (ii) no private sector alternative can avert failure, and (iii) it is in the public interest to do so.⁶²

Similarly to the BRRD, the Commission's straw-man proposal assigns the responsibility for making the above determination primarily to the CCP's competent authority (supervisor) and secondarily to the CCP's resolution authority.

Technically, this language complies with the FSB recommendation that an effective resolution regime should empower the resolution authority "to act promptly and before the point at which the chance of stabilising the CCP is lost".⁶³ As a practical matter, however, the authorities responsible for a CCP must confront and solve two problems: i) how to coordinate with the authorities responsible for the resolution of a failed clearing member, and ii) when to initiate resolution.

5.3 Coordination with resolution authorities of failing members

There is considerable mutual benefit to making the response of the CCP (and its supervisory/resolution authorities) contingent on the decisions and actions taken by the failed bank's resolution authority. Specifically, the CCP and its resolution authority should not start the CCP's loss allocation waterfall without giving the resolution authority of the failed clearing member the opportunity to implement bail-in. If bail-in of investor obligations leads to the stabilisation of the bank/clearing member in resolution, the clearing member can continue to meet its obligations to the CCP, and the CCP need not start the loss-allocation waterfall at all (see Figure 5).⁶⁴

Achieving this level of coordination is a sizeable task, especially for the G-SIBs that are the principal dealers in derivatives and the principal clearing members in major CCPs. At a minimum, the resolution plans for banks will need to include provision for transmission of information about the status of the bank-in-resolution to the supervisory and resolution authorities of the CCPs in which the bank-in-resolution is a clearing member. Ideally, the CCP should not be able to start its loss-allocation waterfall unless it has received a 'no objection' opinion from its supervisor, and the CCP's supervisor should be required to consult the

⁶² In addition, in line with the guidance in the relevant annex of the Financial Stability Board Key Attributes for Effective Resolution Regimes¹⁵, a CCP could be placed in resolution even if the first two of these conditions are strictly speaking not met, where the application of further recovery measures by the CCP could prevent its failure but could compromise financial stability in the process (European Commission, 2015, p. 7).

⁶³ Specifically, the resolution authority "should be able to intervene in a timely and forward-looking way before the end of the waterfall" (Gracie, 2015).

⁶⁴ Such an approach would also increase the likelihood that the bank-in-resolution could continue to provide the CCP with payments, settlement and custody services.

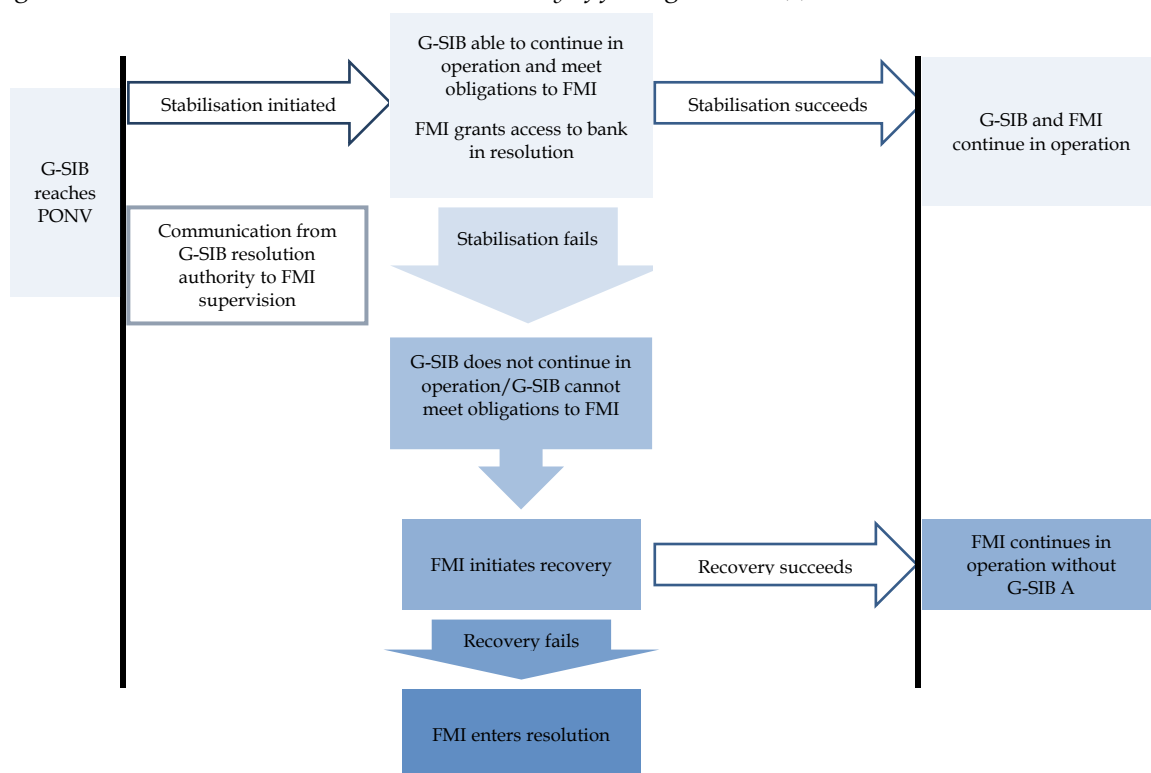
resolution authority for the bank/clearing member in resolution prior to giving such a ‘no objection’ opinion.

Under the Commission’s putative legislative proposal,

Competent authorities could be granted specific powers to intervene in the operations of CCPs where their viability is at risk but before they reach the point of failure or where their actions would highly likely be detrimental for overall financial stability. These powers could be used in either a scenario where a clearing member(s) have defaulted Notably they could require the CCP to undertake specific actions in its recovery plan, or to refrain from taking such action.⁶⁵

Could one such specific power be the requirement that the supervisor of the CCP to coordinate with the resolution authority of the failed clearing member so that the CCP would refrain from starting its default waterfall, so as to allow bail-in to stabilise the bank in resolution?

Figure 5. Coordination with resolution authority of failing member(s)



The second issue is when to initiate resolution – a step that effectively transfers control from the management and board of the CCP to the resolution authority for the CCP. Three alternatives are:

1. Immediately, upon the failure of a clearing member. This seems too soon for full resolution, particularly if the resolution authority of the CCP can utilise its early intervention powers to allow the resolution authority for the failed clearing member time to stabilise the bank-in-resolution.

⁶⁵ European Commission (2015), emphasis added.

2. Finally, after the CCP's waterfall has run dry, the default fund has been exhausted and alternative loss allocation methods applied in line with the CCP's rules. This may be too late to initiate resolution, particularly if there is a possibility that the CCP may not be able to continue to perform its critical economic function of clearing new transactions.
3. At an intermediate point, such as the point at which it becomes apparent that loss allocation will extend beyond the contribution of the failed clearing member to the default fund.⁶⁶ Such a point would allow the resolution authority to take control of the CCP, direct the affairs of the CCP and make the decisions that could affect financial stability, including the objective of the exercise (i.e. whether the CCP should be resurrected or wound down) as well as the order and mix of recovery/resolution tools (e.g. replenishment of the default fund, implementation of margin gains haircutting and/or tear-ups).

As part of the resolution planning exercise the resolution authority should assess the resolvability of the CCP and identify any impediments to resolvability.⁶⁷ One impediment is the inability to replenish the default fund immediately, if it becomes exhausted. The default fund is the backstop to the margin that the defaulting clearing members post to the CCP and the CCP's own skin in the game, and the default fund is the means by which CCPs mutualise risk. Without an adequate default fund a CCP may have difficulty in accepting new transactions; if so, it would not be performing its critical economic function (Gracie, 2015).

Consequently, a key component of any CCP's resolution plan is likely to be a statement of how the CCP would ensure an immediate replenishment of the default fund, if the fund were to become exhausted.⁶⁸ Under current rules replenishment is not immediate: at the earliest it is the next business day, and some CCPs allow members several weeks to come up with the required cash or collateral.⁶⁹

If CCPs are to be resolvable, replenishment of the default fund should be immediate. One possible approach is a contingent commitment facility upon which the CCP could draw if the default fund is exhausted and the clearing member failed to immediately fulfil the CCP's request for replenishment. Another is to fund the replenishment in advance, but put this into escrow for use as the default fund for a bridge CCP to be taken off the 'shelf' and activated in the event that the CCP enters resolution and the losses exhaust the original default fund (JPMorganChase, 2014). However, both measures are not without substantial business and social costs, which are likely to create major obstacles for their implementation.

Finally, resolution plans will have to reconsider the systemic implications of supplemental loss-allocation methods (margin gains haircutting and tear-ups).⁷⁰

⁶⁶ This is the point advocated by the FSB. See (FSB 2016, pp. 14-15).

⁶⁷ European Commission (2015, p. 6).

⁶⁸ The level to which the default fund should be replenished is also a question that the resolution plan should address. This will in part depend on whether or not the plan calls for the failed FMI, once stabilised and restructured in resolution, to resume its prior activity levels.

⁶⁹ Nor is the replenishment obligation necessarily finite: in some CCPs members are expected to be 'good to the last drop,' i.e. to keep refilling the default fund until their own capital is exhausted. However, such a requirement would preclude the CCP from being awarded 'qualified' status. That in turn would require banks to hold higher capital against their exposure to the non-qualified CCP.

⁷⁰ Implementation of such measures could adversely affect financial stability (see p. 18 above). Rather than run such a risk, should CCPs consider stopping at the bilateral stage? Such a 'bilateral CCP' might work as follows. The CCP shall have two clearing members A and B. The CCP's contract with each of its clearing members will be an ISDA standard netting agreement with mutual margining above a

6. Conclusion and policy recommendations

Financial stability depends on the ability of financial market infrastructures to make payments, settle securities and foreign exchange transactions, and clear derivatives. Consequently, it is important that FMIs are robust, i.e. extremely unlikely to fail and resolvable, if they do fail. The substantial and tangible benefits a well-functioning FMI could contribute to stabilising the financial system should outweigh the risk concentration problem it presents. This could only be realised by ensuring the robustness of both the FMIs themselves and the banks.

Considerable progress has already been made in this direction. In particular, banks have greatly strengthened their condition. In line with tighter regulation and stricter supervision, banks have significantly increased their capital and substantially improved their liquidity. They have also developed recovery plans and improved governance. Taken together, these measures reduce the risk that a bank would fail and therefore reduce the risk to the FMIs of which the bank is a member.

Banks are also becoming resolvable. This too lowers risk to FMIs because it raises the prospect that the bank-in-resolution can continue to meet its obligations to the FMIs of which it is a member. The 1st Interim Report of the CEPS Resolution Task Force outlines how the authorities can – under the terms of the BRRD – achieve this result.

There is no guarantee that the authorities will succeed, however. It is still possible that a failed bank could default on its obligations to an FMI and that the ensuing losses could cause the FMI itself to fail. Such a failure could interrupt payments, stall securities settlement and/or block derivatives clearing.

To avoid such systemic shocks authorities are considering how to make FMIs resolvable, such that, if they were to fail, they could – at no cost to the taxpayer – either be wound down in an orderly manner (with another FMI taking over the failed FMI's critical economic functions) or be recapitalised and restructured so that the FMI could itself continue to operate. To this end, the FSB has developed key attributes for an effective resolution regime for FMIs, and the Commission is now considering legislation that would implement such attributes for FMIs in the EU.

The CEPS Task Force on Financial Sector Resolution welcomes such legislation and offers the following recommendations:

- ***Coordinate, coordinate, coordinate.*** By definition and design, FMIs impact the entire market as well as each of their participants and users. In particular, FMIs are closely interconnected with the global systemically important banks (G-SIBs), which are their

nominal threshold amount. The contracts will be valued at mid-market rates. The margin required should be at least equal to the close-out amount, and consist of two parts:

- The amount required to close out the contract utilising mid-market rates. This will be posted by the out-of-the-money counterparty. Note that the CCP will have an offsetting position: the amount that the CCP might have to post should be equal to the amount that it should receive.
- An amount to defray expected replacement cost. This should equal the capital of the CCP.

The CCP contracts will adhere to the ISDA stay protocol. In the event that A enters resolution, the stay protocol will kick in to allow the resolution authority of A to determine if bail-in of investor obligations will be sufficient to stabilise the bank. If so, A continues to meet its obligation to the CCP and close-out is not initiated. If bail-in has to proceed further up the creditor hierarchy, under the terms of the BRRD derivatives will be closed out. As the total margin posted equals the close-out amount the CCP has no claim on or obligation to the estate of bank A in resolution.

principal members. FMIs are also interconnected with one another. Resolution at one FMI could therefore impact all G-SIBs, other FMIs and the markets at large. Consequently, coordination is critical, not only within the EU but also between the EU and third countries, especially the United States. This should start with resolution plans, continue during recovery/runway to resolution into the actual resolution, including both the stabilisation and restructuring phases for G-SIBs headquartered or active in the EU as well as for the FMIs inside and outside the EU in which such G-SIBs participate.

- ***Don't jump the gun.*** In particular, the FMI's supervisor and resolution authority should coordinate closely with the resolution authorities for a failed G-SIB member. The FMI should give the G-SIB's resolution authority an appropriate amount of time to attempt to stabilise the bank-in-resolution. This would allow the bank in resolution to continue to meet its obligations to the FMI, so that the FMI need not even initiate its recovery procedures. If necessary, the FMI supervisor should make use of its early intervention powers to achieve this outcome.
- ***Don't be late.*** There is a limit to the amount of time that the FMI can give to the resolution authority of the failed G-SIB, for the FMI (as well as the supervisory and resolution authorities responsible for the FMI) will need sufficient time to put in place the recovery and, if necessary, the resolution measures needed to ensure continuity of the FMI's critical economic functions.
- ***Identify and remedy impediments to FMI resolvability.*** Removing impediments to FMI resolvability can accelerate the resolution of the FMI (and therefore allow more time for the resolution authority of the failed G-SIB member to stabilise the G-SIB). In particular, CCPs (especially those without readily available alternatives) should take steps to ensure that the loss allocation ('waterfall') process can be completed, if necessary, over a 'resolution weekend'. This includes steps to accelerate the auction of the failed members' positions, as well as provisions to replenish the default fund immediately, if it becomes exhausted.

Taken together, these recommendations would go a very long way towards ensuring that FMIs could continue to operate, even under extremely adverse circumstances. That in turn would make a significant contribution to financial stability.

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Annex 1. G-SIFI membership/participation in major CCPs

Consolidated at G-SIFI group level, based on FMIs' public websites, February 2016

<i>G-SIFIs including subsidiaries</i>	<i>LCH. Clearnet</i>	<i>ICE Clear Europe</i>	<i>CME Clear Europe</i>	<i>Eurex</i>	<i>Euro-CCP</i>	<i>CME</i>	<i>ICE Clear Credit</i>	<i>OCC</i>	<i>NSCC</i>	<i>FICC</i>	<i>JSCC</i>	<i>SGX Derivatives</i>	<i>OTC Clearing Hong Kong</i>
Bank of America	X	X		X	X	X	X	X	X	X	X	X	
Barclays	X	X		X	X	X	X	X	X	X	X	X	
BNP Paribas	X	X	X	X	X	X	X	X	X	X	X	X	
Citigroup	X	X	X	X	X	X	X	X	X	X	X	X	X
Credit Suisse	X	X	X	X	X	X	X	X	X	X	X	X	X
Deutsche Bank	X	X	X	X	X	X	X	X	X	X	X	X	
Goldman Sachs	X	X	X	X	X	X	X	X	X	X	X	X	
HSBC	X	X	X	X	X	X	X	X	X	X		X	X
ING Bank	X			X				X	X	X			
JP Morgan Chase	X	X	X	X	X	X	X	X	X	X	X	X	
Mitsubishi UFJ FG	X			X				X	X	X	X		
Mizuho FG	X	X		X		X		X	X	X	X	X	
Morgan Stanley	X	X	X	X	X	X	X	X	X	X	X	X	
Royal Bank of Scotland	X	X	X	X		X		X	X	X	X		
Société Générale	X	X	X	X		X	X	X		X	X		
Standard Chartered	X									X		X	X
State Street		X		X		X			X	X			
Sumitomo Mitsui FG										X	X		
UBS	X	X	X	X	X	X	X	X	X	X	X	X	
Unicredit Group	X	X		X									
Wells Fargo	X	X				X	X	X	X	X			
Agricultural Bank of China													
Bank of China				X									X
Bank of New York Mellon	X			X					X	X			
China Construction Bank													
Groupe BPCE													
Groupe Crédit Agricole	X			X		X					X		
Industrial and Commercial Bank of China Limited	X							X	X	X			X
Nordea	X	X		X	X								
Santander	X	X		X	X	X			X				

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