

A Guide to Best Practice in the European Repo Market

ICMA European Repo and Collateral Council

~~September 2020~~ March 2021



About ICMA

ICMA is a not-for-profit membership association that serves the needs of its wide range of member firms in global capital markets. Currently ICMA has around 600 members in 62 countries. Among its members are private and public sector issuers, banks and securities houses, asset managers and other investors, capital market infrastructure providers, central banks, law firms and others.

ICMA market conventions and standards have been the pillars of the international debt market for more than 50 years, providing the framework of rules governing market practice which facilitate the orderly functioning of the market. Since the early 1990's, ICMA has played a significant role in promoting the interests and activities of the international repo market, and of the product itself. ICMA's European Repo and Collateral Council (ERCC) represents the firms active in Europe's cross-border repo and collateral markets.

This guide has been authored by Richard Comotto, Senior Adviser to the ICMA, and is reflective of substantial input from member firms of the ICMA European Repo and Collateral Council.

© International Capital Market Association (ICMA), Zurich, 2021⁹. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means without permission from ICMA.

Preface

ICMA's European Repo and Collateral Council (ERCC) was established in December 1999, as the European Repo Council (ERC), to represent the cross-border repo market in Europe. In 2015 it was decided to change the name of the ERC to the ERCC in order to recognise the increasingly intimate relationship between repo and collateral and the ERC's substantial focus on collateral. Since the financial crisis of 2007, the importance of collateral has grown significantly, and the repo market is the main means by which collateral is sourced, priced and circulated.

Membership of ICMA's ERCC is open to those ICMA members who transact repo and/or manage collateral in Europe. Currently, there are more than 100 members comprising the vast majority of firms who are actively involved in this market.

A key role of ICMA's ERCC has been to develop consensus solutions to issues arising in a rapidly evolving marketplace, consolidating and codifying best market practice and working to standardise repo documentation. The Global Master Repurchase Agreement (GMRA), published by ICMA and supported by annually-updated legal opinions in respect of over 60 jurisdictions, is the predominant standard master agreement in the cross-border repo market and many domestic markets.

ICMA's ERCC also plays a significant role in nurturing the growth and wider use of the repo market in Europe, among both banks and their customers, by providing education and market information. In addition, ICMA has been conducting a [semi-annual survey](#) of the European repo market since 2001. During this period, this survey has become regarded as the only authoritative indicator of the size, structure, and dominant trends in the European repo market, and it expected to remain relevant long after the introduction of the EU Securities Financing Transaction Reporting (SFTR).

This latest version of the Guide introduces a number of new guidelines intended to address issues that have arisen since the last publication, as the market continues to evolve and develop. These are intended to provide additional clarification and market best practice for practitioners in the European repo market.

In 2020, ICMA also published a complementary best practice guide: the [ICMA Recommendations for Reporting under SFTR](#), that aims to help members interpret the regulatory reporting framework specified by ESMA and sets out complementary best practice recommendations to provide additional clarity and address ambiguities in the official guidance.

Martin Scheck

Chief Executive

International Capital Market Association (ICMA)

Gareth Allen, UBS AG

Chairman

ICMA European Repo and Collateral Council (ERCC)

Contents

1 Purpose and scope of the Guide	6
2 Best practice in initiating a repo transaction	8
Be certain of the identity of your counterparty.....	8
The need for clear communication.....	8
How to quote the price of a repo	9
How to quote the Purchase Price	9
Fixing the Purchase and Repurchase Dates	9
Termination of repos late in the day	17
Negotiating repos with the intention of registering them with a CCP after agreement.....	18
Allocation of collateral in a general collateral (GC) repo.....	19
Agreeing the price of collateral.....	19
Agreeing permission to substitute collateral.....	19
Agreeing interest rates for late payments.....	20
Verifying the terms of transactions	21
Settlement	32
Recommended delivery size (shaping)	35
Partial delivery	35
Anticipating problems that may be caused by low or negative repo rates.....	38
Calculating floating-rate repo interest payments.....	43
Calculating open repo interest payments.....	47
Netting	49
3 Best practice in margining repo	51
Fixing an initial margin or Haircut	51
Calculation of Transaction Exposure for the purposes of Forward Transactions.....	53
Calculating a margin call	53
What transactions are included in the calculation of the Net Exposure of non-forward repos?.....	56
Hierarchy of tri-party contractual provisions.....	58
Late transactions and net exposure/variative margin calculations.....	59
Margining failed purchases.....	59
Margining failed repurchases	60
What transactions are included in the calculation of the Net Exposure of forward repos?	60
What price is used to value collateral?	60
How often should Net Exposure be calculated and margin called?	63
Exposure thresholds and minimum transfer amounts	63
Periodic elimination of Net Exposure below an agreed threshold.....	64

Suspension of an agreed exposure threshold and minimum transfer amount.....	64
What is the deadline for making a margin call?	65
Which securities have to be accepted as margin?.....	66
Should initial margin or Haircut be deducted from margin securities?.....	66
What is the deadline for delivering margin?	66
Can margin securities be substituted?.....	66
Interest payments on cash margin	66
How is “repricing” used to eliminate Net Exposures?	67
When is margin returned?	68
What happens if margin is not delivered?.....	68
What if a party disputes a margin call?.....	69
Deadline for response to variation margin queries	69
Margin parameters to be agreed between parties before trading	71
Defining stale collateral prices.....	71
4 Best practice in managing the life cycle of a repo.....	73
Failure to deliver	73
Exercising a ‘mini close-out’ in response to a failure to deliver on the Repurchase Date	73
Coupon, dividend and other payments on collateral	75
Margining ex-dividend securities.....	77
The effect of negative accrued interest on collateral value	77
Dealing with the resetting of a coupon on floating-rate collateral in a sell/buy-back.....	79
Exercising permissions to substitute collateral.....	80
The issuance of termination notices to counterparties.....	81
Confirmation and affirmation of post-trade amendments and updates to the agreed terms of a repo and the exercise of options.....	81
Addresses	82
Annex I - Understanding repo and the repo market.....	83
Annex II - Glossary of repo terminology	96
Annex III - What are open, evergreen and extendible repos?.....	127
Annex IV - Example of a mini close-out notice	133
Annex V - Forms of confirmation in Annex II of the GMRA	134
Annex VI - The effect of negative interest on collateral value	136

1 Purpose and scope of the Guide

- 1.1 This Guide is published by ICMA's ERCC. Its purpose is to help foster a fair and efficient European repo market by recommending practices which market experience suggests can help avoid uncertainty or disagreement about transactions, and consequent delay or disruption to repo trading and settlement. With the same purpose in mind, the Guide also codifies market conventions, where this has been thought to be helpful, usually in response to queries from market participants.
- 1.2 The practices set out in the Guide are general recommendations only. Parties to repos are free to agree other terms, where they see fit. It is not necessarily a problem if recommended best practice is not followed, provided the parties recognise the risks to which they may expose themselves as a result.
- 1.3 The Guide has been written to assist staff in ERCC firms, but others may find the Guide helpful. It presupposes some knowledge and experience of how the repo market operates. The Guide is not a repo market training manual, as it focuses selectively on key issues in the trading, management and settlement of repo. However, to assist the reader, Annex I provides a concise description of the functioning of repo and the repo market. Annex II provides a glossary of terminology.
- 1.4 This Guide, published by ICMA's ERCC, supersedes the repo trading practice guidelines published by the ERC over a decade ago, which sought to explain best practices and conventions for the European repo market. It also supersedes the best practices and conventions for repo margining, the codification of floating-rate repo conventions, the recommendation on repo matching as a driver for risk reduction and the recommendation regarding fails in negative interest rate repos.
- 1.5 The Guide applies to both *repurchase transactions* and *sell/buy-backs*, which are both types of repo, but does not apply to *securities lending transactions*.
- 1.6 The focus of the Guide is on trading and post-trade conventions in the cross-border repo market in Europe. It therefore differs in emphasis from codes published or sponsored by regulatory authorities, which have a prudential purpose and are focused on domestic repo markets.
- 1.7 The purpose of the Guide (to help foster a fair and efficient market in repo) is one supported by the regulatory authorities but it is not the practice of regulators to endorse voluntary codes or guidelines. The Guide is not an alternative to official regulatory requirements.
- 1.8 The Guide will be updated from time to time to reflect changes in the repo market in response to economic, monetary, financial, business, regulatory, legal and technological developments. The latest version of the Guide is posted on

the ICMA website at www.icmagroup.org/repoguide. ICMA will publicise updates but readers should periodically check the ICMA website to ensure that they are using the latest version of the Guide.

- 1.9 Questions on the Guide, as well as proposals for change or improvement, should be addressed to the ICMA ERCC at the offices of ICMA Ltd at 110 Cannon Street, London EC4N 6EU or legalhelpdesk@icmagroup.org.
- 1.10 The information contained herein is provided to members of ICMA (“Members”) for general guidance only and should not be relied upon as advice. ICMA does not provide legal or other advice and expressly disclaims any responsibility for the information below. Readers should obtain such legal or other professional advice as appropriate. ICMA makes no representations or warranties, express or implied, as to the accuracy and completeness of any information contained herein.
- 1.11 Neither the ERCC nor the ICMA can act as arbitrator in the event of a dispute between parties to a repo, even where the dispute is about the application of a recommended practice, although ICMA’s ERCC will endeavour to offer further clarification of recommendations, where this is necessary.
- 1.12 Terms used in the Guide which are terms that are defined in the Global Master Repurchase Agreement (GMRA) are indicated by capital initials.

2 Best practice in initiating a repo transaction

Be certain of the identity of your counterparty

- 2.1 A party to a financial transaction is typically one of a number of legal entities within a group, often with similar names. It is essential, for legal, regulatory, credit risk management and operational purposes, that each party to a transaction knows the precise legal identity of its counterparty. If available and widely accepted, it is best practice to use legal entity identifiers (LEI) in Confirmations and affirmations.

Best practice recommendation. Parties should determine the precise legal identity of their counterparty. If available and widely accepted, parties should use legal entity identifiers (LEI) in Confirmations and affirmations.

- 2.2 One party can transact repos with another party under the same GMRA as either a principal (dealing in its own name and for its own benefit) or as an agent (dealing in a client's name and for the client's benefit).¹ The legal and regulatory relationship, and the risk exposure, between two principals is very different to that between a principal and an agent, or between two agents. Parties should therefore make clear to each other, at the point of trade, on what basis they are dealing. In addition, where one party is acting as an agent, they should both have signed the Agency Annex to the GMRA. If both parties are acting as agents, they will have to seek legal advice, as the Agency Annex to the GMRA does not cover transactions between agents.

Best practice recommendation. Each party should make clear to the other, at the point of trade, if it is acting as a principal or an agent.

The need for clear communication

- 2.3 When negotiating by telephone or electronic messaging system, it is essential that the precise terms of a transaction are clearly understood by both parties. On the telephone, there is a tendency towards the use of market slang and, when typing on an electronic messaging system, it is common to try to speed up a conversation by using abbreviations (above and beyond widely-understood conventions such as ISO currency codes). Both practices can lead to confusion. Parties should avoid sacrificing clarity for speed. It is the responsibility of both parties to ensure that they understand fully the terms of a transaction and, where there is any uncertainty, to insist on clarification from the other party. On the telephone, the key economic terms of a transaction should be rehearsed by one of the parties at the end of the conversation. Post-trade checks should also be conducted using Confirmations and, where necessary, affirmation (see paragraphs 2.34-2.57 below).

¹ Note that the name of the client will, for commercial reasons, typically not be revealed to the trading desk of the agent's counterparty. However, the client must be identified to the credit and compliance departments of the counterparty. It is common practice to use a code to identify the client to the trading desk and to supply the credit and compliance departments of the counterparty with the underlying identity on a confidential basis.

Best practice recommendation. When negotiating by telephone or electronic messaging system, parties should ensure that they understand fully the terms of a transaction and, where there is any uncertainty, insist on clarification from the other party. On the telephone, the key economic terms of a transaction should be listed by one of the parties at the end of the conversation. Post-trade checks should also be conducted using Confirmations and, where necessary, affirmation.

How to quote the price of a repo

2.4 Repurchase transactions are quoted in terms of the repo rate, that is, the percentage per annum rate of return on the Purchase Price to be paid by the Buyer to the Seller on the Repurchase Date (or, in the case of some open repos and floating-rate repos, on interim payment dates). The repo rate should be quoted on the basis of the day count and annual basis convention (also called the day count fraction convention) prevailing in the wholesale money market in the currency of the Purchase Price (notably, in the deposit and forward foreign exchange markets). This is almost always the actual day count and 365-day annual basis (A/365F) or the actual day count and 360-day annual basis (A/360). In the GMRA, the repo rate is called the Pricing Rate. This terminology should be used to identify the repo rate in Confirmations and affirmations between parties using the GMRA.

2.5 In the past, sell/buy-backs were always quoted in terms of the forward price of the collateral. Formulae for calculating the forward price are given in the glossary in Annex II. Sell/buy-backs are now often quoted, like repurchase transactions, in terms of the repo rate.

How to quote the Purchase Price

2.6 Parties to a repurchase transaction conventionally agree the Purchase Price of fixed-income securities in terms of the dirty or gross price of the collateral (that is, **including** the accrued interest since the last coupon date). The Purchase Price of a repurchase transaction also incorporates any initial margin or Haircut.

2.7 Parties to a sell/buy-back have traditionally agreed the Purchase Price of fixed-income securities in terms of the clean or net price of the collateral (that is, **excluding** accrued interest).² However, the sum of money actually paid to the Seller on the Purchase Date is equal to the value of the collateral at its dirty price (clean price plus accrued interest), just as it is for a repurchase transaction. Note, in the remainder of the Guide, the term Purchase Price is used for both repurchase transactions and sell/buy-backs to mean the cash amount calculated using the dirty price of a fixed-income security.

Fixing the Purchase and Repurchase Dates

2.8 Parties are able to vary the period between the date on which a repo is agreed (transaction date or T) and the Purchase Date, when cash and collateral are exchanged. Depending on the currency and jurisdiction, parties can agree to schedule the Purchase Date of non-forward repos on:

- the same day as the transaction date (in which case, settlement is said to be 'same-day' or T+0);

² This convention is implicitly reflected in the Buy/Sell-Back Annex of the GMRA. See paragraphs 2(a)(ii) and 3(f) of the GMRA 2000 and 2011 Buy/Sell-Back Annexes.

- the next Business Day (called 'next-day' or T+1 settlement);
- the second Business Day after the transaction date (called 'spot' or T+2 settlement);
- the third Business Day after the transaction date (T+3 settlement).

Any Purchase Date later than T+3 is now usually considered a forward repo, whatever the currency (see paragraph 2.16 below).

2.9 The common non-forward settlement period in the repo market has tended to be one Business Day earlier than the common non-forward settlement period in the cash market for the same security. This is because the net cash positions that need to be financed and the net securities positions that need to be covered in the repo market are only known **after** close of business on the cash market transaction date and repos therefore have one less Business Day than cash market transactions to settle.

2.10 When the non-forward cash transactions in many European markets settled at T+3 but non-forward repos in the same markets settled at T+2 or earlier, some customers had operational difficulties in delivering securities to settle repos one day faster than required for cash transactions. In such cases, dealers often agreed to settle at T+3. This later repo Purchase Date became known as a 'corporate value date'. After the settlement of non-forward cash transactions moved in 2014 to T+2 in European markets which had previously settled at T+3 (see paragraph 2.11 below), it appears to have remained the convention to use the term corporate value date to describe settlement at T+3. However, parties are advised to check with each other when that term is used.

2.11 Until 6 October 2014, the common non-forward settlement period in the cash market for eurozone government bonds was T+3 and, as a consequence, the common non-forward Purchase Date for repos against these securities was T+2 (with the corporate value date being T+3). In 2014, ICMA and other European securities market associations recommended that, with effect from 6 October 2014, their members settle cash transactions in securities in the EEA no later than T+2. This recommendation was made in order to smooth the implementation in 2015 of a requirement of the EU Central Securities Depositories Regulation (CSDR) that mandates that settlement no later than T+2 for cash, repo and securities lending transactions in 'transferable securities' regulated under the second Market in Financial Instruments Directive (MiFID) and executed on 'trading venues' regulated under a parallel regulation, MiFIR. Although the T+2 settlement requirement of the CSDR excludes transactions executed in the OTC market and in 'non-transferable securities', ICMA and other financial market associations recommended that, in order to avoid the confusion that might be caused by different settlement periods, all non-forward cash transactions in securities in Europe should settle no later than T+2, whether or not subject to CSDR. It was expected that the common non-forward Purchase Date for repos against eurozone government securities would move from T+2 to T+1. For the Purchase Date of forward repos, see paragraph 2.16 below.

2.12 The Repurchase Date of a repo can be fixed in a variety of ways.

- For fixed-term repos, the Repurchase Date can be agreed in terms of:
 - a specific date; or
 - for maturities which are multiples of one month, the End/End Rule and Modified Following Business Day Convention (see Annex II).
- For open repos, the Repurchase Date is not fixed on the transaction date but can be called at any time by either the Buyer or the Seller, subject to a minimum period of notice to the other party (see paragraph 2.20 below).

2.13 The definition of Business Day in the GMRA does not specify when the Business Day ends.³ This can create uncertainty about when a notice served by one party on another (eg a Default Notice) comes into effect. Notices delivered after the close of business do not take effect until the following Business Day. It is therefore best practice for parties to consider whether to agree the times to be deemed as close of business in the countries in which they are located and in other relevant locations, and to record these times in Annex I of their GMRA or, if that is not practicable, in Confirmations. A legal judgement in England in 2016 made clear that close of business for the purpose of serving a notice under the GMRA is not the same as the end of the dealing day and, for an international bank, is likely to be in the early evening (Lehman Brother International Europe v ExxonMobil Financial Services, October 2016).

Best practice recommendation. It is best practice for parties to consider whether to agree the times to be deemed as being the close of business in the countries in which they are located and in other relevant locations, and to record these times in Annex I of their GMRA or, if that is not practicable, in Confirmations.

2.14 In the case of the euro, because public holidays vary between member states, a Business Day has been defined as any day on which the TARGET central bank payments system is open. However, for the purpose of serving notices on counterparties, account needs to be taken of the fact that firms based in different eurozone member states observe different national or regional public holidays. For example, if a party in one eurozone country serves a notice terminating an open repo on a party in another eurozone country on a public

³ Under the GMRA 2000 paragraph 2(e) and 2011 paragraph 2(f), a Business Day is defined as:

- For repos to be settled at a security settlement system, any day on which that system is open for business;
- For repos to be settled by delivery of securities at a custodian bank, any day on which that bank is open for business, as well as a day on which banks generally are open for business in the city which hosts the central bank payments system for the currency of the Purchase Price or, in the case of the euro, any day on which the TARGET payments system is open (which means any weekday except Easter Friday and Monday, May Day, Christmas, the day after Christmas and New Year's Day).

holiday in the second country, even though it is a TARGET Business Day, there may be no one working at the offices of the second party who is able to respond in time. It is therefore best practice for parties to agree on whether to include relevant domestic public holidays in the definition of a Business Day in Annex I of their GMRA or, if that is not practicable, in Confirmations.

Best practice recommendation. It is best practice for parties to consider whether to include relevant domestic public holidays in the definition of Business Day in Annex I of their GMRA or, if that is not practicable, in Confirmations.

2.15 For non-forward repos, unless otherwise agreed between the parties:

- The day or days **between** but not including the transaction date and non-forward Purchase Date should be a Business Day or Business Days in the city in which the currency of a repo is to be paid.
- If the city in which the currency is to be paid is different from the city in which the collateral is to be delivered, the day or days between but not including the transaction date and non-forward Purchase Date must also be Business Days in the latter city as well.
- However, the day or days between the transaction date and non-forward Purchase Date do not have to be a Business Day or Business Days in the city or cities in which the parties are located, if these are different from the cities in which payment and delivery are due, unless the parties agree otherwise.
- For example, if a London party transacts a euro-denominated repo against a German government bond to be delivered across Euroclear in Brussels with a party in Stockholm for a Purchase Date of T+2, then T+2 has to be a Business Day in London, Stockholm, Brussels and for TARGET, but T+1 only has to be a Business Day in Brussels and for TARGET. The convention for non-forward repos is summarised in the following table.

Table 1: What days should be Business Days in each relevant location?

	location of			
	Party A	Party B	central bank payment system	security settlement system(s)
transaction date (T)	yes	yes	yes	yes
any Business Days between T and non-forward Purchase Date	not necessary	not necessary	yes	yes
Purchase Date	yes	yes	yes	yes

Repurchase Date	yes	yes	yes	yes
------------------------	-----	-----	-----	-----

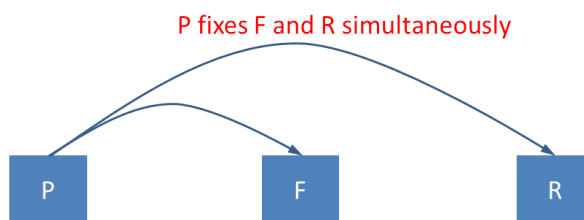
2.16 Forward repos. A forward repo is a transaction with a Purchase Date one Business Day or more after the common settlement date for cash transactions in the same security.

2.17 For forward repos for which the periods from the common non-forward Purchase Date to the forward Purchase Date and to the Repurchase Date are both multiples of one month, there are two methods of fixing the forward Purchase Date and Repurchase Date:

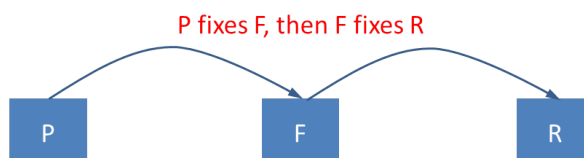
- Method 1 (constant date or simultaneous method). Both dates can have the same day number in the future months as the common Purchase Date for non-forward repos. For example, if the common non-forward Purchase Date is T+1, a 1x2 forward repo would have a forward Purchase Date which is the same date as T+1 but one calendar month later, and a Repurchase Date also on the same date but two calendar months later. For example, the dates for a 1x2 forward repo transacted on Wednesday, 2 September would be:
 - common non-forward Purchase Date, assuming T+1: (Thursday) 3 September
 - 1-month Purchase Date: (Monday) 5 October, as 3 October is on Saturday
 - 2-month Repurchase Date: (Tuesday) 3 November.
- Method 2 (sequential date or knock-on method). The forward Purchase Date can have the same day number in the near future month as the common non-forward Purchase Date, while the Repurchase Date can have the same day number in the far future month as the forward Purchase Date. Using the same example as above (a 1x2 forward repo in a currency in which non-forward repos settle T+1 that is transacted on Wednesday, 2 September), the dates would be:
 - common non-forward Purchase Date, assuming T+1: (Thursday) 3 September
 - 1-month Purchase Date: (Monday) 5 October, as 3 October is on Saturday
 - 2-month Repurchase Date: (Thursday) 5 November.

In contrast to the first method, the Repurchase Date in the second method is fixed by reference to the forward Purchase Date of 5 October, not the common non-forward Purchase Date of 3 September. In other words, under Method 2, the fixing of the Purchase Date has a knock-on effect on the fixing of the Repurchase Date. This would not be the case under Method 1. The two methods are illustrated in the diagram below (where P is the common non-forward Purchase Date, F is forward Purchase Date and R is the Repurchase Date).

- **Method 1** (constant date or simultaneous fixing method)



- **Method 2** (sequential date or knock-on fixing method)



- 2.18 Method 2 (sequential date or knock-on fixing method) is recommended as best practice, as this ensures that the period between the forward Purchase Date and Repurchase Date will have the same number of days as new non-forward transactions for value on the same Purchase Date. Method 2 is the convention applied elsewhere in the money market.

Worked example: fixing forward Purchase Date and Repurchase Date

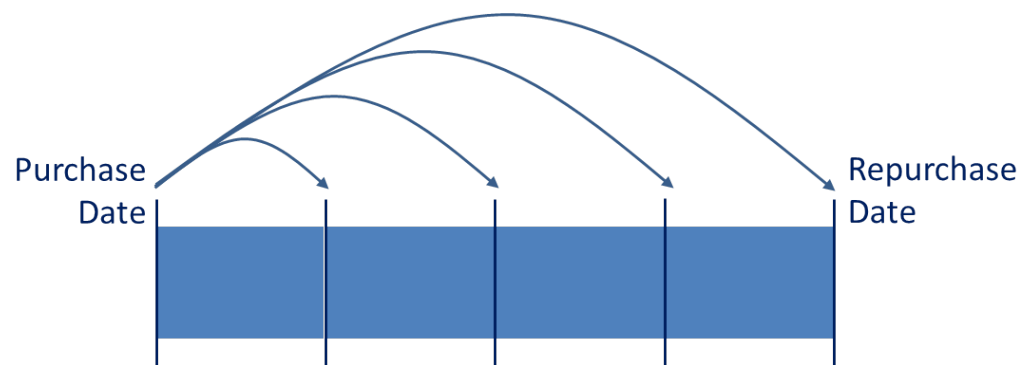
Consider a 3x6 forward repo in pounds sterling executed on Tuesday, 26 May. In sterling, the common non-forward settlement date is T+0. Assume 26 August is a public holiday in the UK. Therefore:

- 1 The 3-month forward Purchase Date: Tuesday, 27 August (it should have been Monday, 26 August, but as this is a UK public holiday, the date moves under the Modified Following Business Day Convention to the next Business Day).
- 2 The 6-month Repurchase Date is Wednesday, 27 November (this is calculated from the 3-month forward Purchase Date of Tuesday, 27 August).

Best practice recommendation. It is best practice to fix the forward Purchase Date of a forward repo at the same day number in the near future month as the common Purchase Date for non-forward repos and to fix the Repurchase Date at the same day number in the far future month as the forward Purchase Date. Therefore, a change in the fixing of the forward Purchase Date (because it is not a Business Day) would affect the fixing of the Repurchase Date.

- 2.19 **Floating-rate repos.** Some floating-rate repos are linked to term interest rate indexes such as LIBOR (other than the overnight or tom/next LIBOR indexes) and EURIBOR. It is convention for such transactions to pay interest at the end of

each interest rate period. For example, a repo indexed to 3-month LIBOR would conventionally pay repo interest at the end of every three months. The market convention for fixing future payment dates here is different to Method 2 (sequential date or knock-on fixing method) recommended for fixing the dates of forward repos in paragraph 2.18 above and more like Method 1 (constant date or simultaneous fixing method). For example, for interest rate periods which are multiples of one month, the start of all future periods should have the same day number in future months as the common non-forward Purchase Date, unless a future date is not a Business Day, in which case, the End/End Rule and Modified Following Business Day Convention would apply to this date (but only this date). This convention ensures that the day counts of the second and subsequent interest rate periods are not shortened by the deferral of the starting dates of earlier periods because of the occurrence of non-Business Days. A series of deferrals would have the undesirable effect of progressively compressing periods as one approached the fixed final Repurchase Date. The convention for fixing floating-rate periods is illustrated in the diagram below.



Worked example: fixing interest rate period and Repurchase Dates

Consider a 3-month floating-rate repo indexed to 1-month GBP LIBOR with a Purchase Date of 25 November. Assume the following 25 and 26 February are on a weekend. The Repurchase Date would then be 27 February. Because 25 December is also not a business day, the start of the second interest rate period should be deferred until 26 December (assuming that is a business day). However, the third interest rate period should start on 25 January, assuming this is a Business Day, and not the following day.

- 2.20 Open repos.** In the GMRA, this type of repo is called an ‘on demand’ transaction. An open repo is initiated without fixing a Repurchase Date. Instead, either party may terminate the transaction (in whole or in part) by giving agreed notice to the other (see Annex III for further detail on the structure and operation of open repos). The GMRA states that termination shall ‘occur after not less than the minimum period as is customarily required for the settlement or delivery of money or Equivalent Securities of the relevant kind’ (GMRA 2000/2011 paragraph 3(e)). It is best practice to interpret this provision as the minimum period customarily required in the repo market for a particular security, rather than the cash market. This is because repos are frequently

settled one day faster than cash transactions (the reason being that repo desks do not know how much they will have to finance or cover until cash positions are finalized at close of business, so cannot start trading until the next Business Day). Notice of termination given after the deadline will not be effective on the same day, but on the next Business Day. Parties need to consider whether the standard provision in the GMRA provides them with sufficient certainty about when collateral will be returned to the Seller and the Repurchase Price paid to the Buyer following the termination of an open repo. When negotiating an open repo, it is therefore essential that the parties have the same understanding of what the deadline is (and in which time zone) for giving notice of termination. If in any doubt, parties should explicitly agree the deadline. Where parties have failed to explicitly agree a notice period prior to trading, the GMRA allocates the decision to the terminating party subject to the restriction that the period of notice should not be less than ~~neither party can unilaterally extend that period beyond~~ 'the minimum period customarily required for the settlement or delivery of money or Equivalent Securities of the relevant kind' (GMRA 2011 paragraphs 3(d) and 3(e)) ~~as this is a contractual requirement laid down in the GMRA. Moreover, the unilateral extension of notice periods would change the nature of the open repo into a type of evergreen repo, which is a distinct type of transaction (see Annex III).~~ But it is of course possible for parties to extend the notice period by agreement. Where parties agree an extended termination notice period, this should be confirmed.

- 2.21 For major classes of security, the recommended delivery periods and deadlines on the publication date of this version of the Guide for giving notice of termination of open repo are set out in Table 2 below.

Table 2: Recommended deadlines for the notification of the termination of open repos

market	issuer	currency	ISIN prefix	notification deadline	settlement date
emerging market	all	USD	US	noon NYT	T+1
			all non-US ISIN including XS	noon NYT	T+1
		EUR		noon UKT	T+1
developed market	corporate	USD	US	noon NYT	T+1
			all non-US ISIN including XS	noon UKT	T+1
		EUR		noon UKT	T+1
		GBP		noon UKT	T+1
	sovereign	USD	US	10:00 NYT	T+0
				noon UKT	T+1

	EUR	all non-US ISIN including XS	13:00 CET	T+1
	GBP		10:00 UKT	T+0

CET = Central European Time; NYT = New York Time; UKT = UK Time

Table 2 is not exhaustive. In the case of securities not listed above, it is best practice for the parties to agree the delivery period and deadline for serving a termination notice and the acceptable means of communication (which includes the telephone) and to document that agreement in Annex I of their GMRA or, if that is not practicable, in Confirmations. See also paragraph 2.98~~86~~ below.

Best practice recommendation. It is best for the parties to an open repo to agree the delivery period and deadline for serving a termination notice and to document their understanding in Annex I of their GMRA or, if that is not practicable, in Confirmations, where either is not certain of the delivery period or deadline, or where the collateral is not widely used.

2.22 The recommended deadlines in Table 2 above also apply to the termination of evergreen repos, including where these are transacted between parties in widely separate time zones. This best practice is intended to reduce disagreements that have arisen when official interest rate changes are announced during the Business Day in one time zone but after the close in the other.

Termination of repos late in the day

2.23 It is possible that a dispute may arise about whether a deadline for the termination of open repos or fixed-term repos with a termination option (including fixed-term evergreens) applies to the sending or receiving of a notice of termination. Parties should avoid such disputes by acting reasonably and in good faith. Giving notice to terminate an open, evergreen or fixed-term repo with a termination option close to a deadline is not advisable where the operations of one of the parties are not sufficiently automated to allow that party to respond rapidly. It is best practice, if giving notice at a time close to the agreed deadline, to ensure that the other party is aware of the notice. This should be done by telephone, rather than by electronic messaging, so that there is no uncertainty about whether the other party received the notice before the deadline.

2.24 If one party terminates an open repo ~~and is permitted by the other party to choose a termination date beyond the normal settlement date~~, the open repo becomes a fixed-term transaction as the parties have fixed the maturity date (which should be confirmed promptly after agreement). If the first party subsequently wishes to terminate the transaction on an earlier date, it can only do so with the agreement of the other party, as would be the case for any other fixed-term repo.

Best practice recommendation. It is best practice, when giving notice to terminate an open repo at a time close to an agreed deadline, to ensure that

the other party is aware of the notice. This should be done by telephone, rather than by electronic messaging.

- 2.25 Parties need to be sure about when collateral will be returned to the Seller and the Repurchase Price paid to the Buyer following the termination of an open repo. Unless this is specifically documented in Annex I of their GMRA or in Confirmations, the default time under the GMRA will be 'not less than the minimum period as is customarily required for the settlement or delivery of money or Equivalent Securities of the relevant kind' (GMRA 2000/2011 paragraph 3(e)). Parties need to consider whether this provides them with sufficient certainty.

Best practice recommendation. It is best practice for parties to consider whether they need to explicitly agree the delivery period for the return of collateral following the termination of an open repo and to record that agreement in Annex I of their GMRA or, if that is not practicable, in Confirmations.

Negotiating repos with the intention of registering them with a CCP after agreement

- 2.26 Parties may negotiate transactions directly or via a voice-broker subject to those transactions being submitted ("given up") to and registered by a CCP. In other words, the parties do not intend to contract with each other but only with the CCP. Thus, the party negotiating to sell collateral intends to sell only to the CCP and the party negotiating to buy that collateral intends to buy only from the CCP. In such transactions, it is best practice for the negotiating parties to explicitly agree that they both intend to contract only with the CCP and that no contract will be formed should the transaction not be registered by the CCP, that is, should the CCP refuse or fail (for any reason) to irrevocably agree to become the buyer to the seller and the seller to the buyer on the terms agreed between the original seller and buyer. It is best practice for the parties negotiating the transactions which they intend to be contingent upon acceptance by a CCP to document that intention in Annex I of their GMRA or, if that is not practicable, in Confirmations (whether under the GMRA, if one is in place between the parties, or under another arrangement).

Best practice recommendation. Where transactions are negotiated directly or via a voice-broker but are contingent upon acceptance by a CCP, it is best practice for the parties involved to explicitly agree that they both intend to contract only with the CCP, so that no contract will be formed should the transaction not be registered by the CCP, and document that intention in Annex I of their GMRA or, if that is not practicable, in Confirmations (whether under the GMRA, if one is in place between the parties, or under another arrangement).

Allocation of collateral in a general collateral (GC) repo

- 2.27 In general collateral (GC) repos which have not been executed on an automatic repo trading system and/or are not being managed by a tri-party collateral management system, it is best practice for the Seller to notify the Buyer of the identity of the collateral which he proposes to deliver as soon as possible after execution and no longer than one hour later. Electronic trading and tri-party systems have their own deadlines.

Best practice recommendation. In general collateral (GC) repos in which the Seller selects the collateral to be delivered to the Buyer, it is best practice for the Seller to notify the Buyer of the collateral which he proposes to deliver as soon as possible after execution and no longer than one hour later.

Agreeing the price of collateral

- 2.28 In repos which have not been executed on an automatic GC repo trading system and/or are not being automatically settled across a tri-party collateral management system, it is best practice for the parties to agree the price or prices to be used to value the collateral as soon as possible after execution and no longer than one hour later or at the same time as the collateral is identified to the Buyer, whichever is sooner. The value for a fixed-income security should include the outstanding accrued interest on that security.

Best practice recommendation. In general collateral (GC) repos in which the Seller selects the collateral to be delivered to the Buyer, it is best practice for the parties to agree the price or prices to be used to value the collateral as soon as possible after execution and no longer than one hour later or at the same time as the collateral is identified to the Buyer, whichever is sooner.

Agreeing permission to substitute collateral

- 2.29 A Buyer in a repo may grant the Seller permission to substitute some or all collateral during the term of the transaction one or more times. This allows the Seller, at any time between the Purchase Date and Repurchase Date, to call for the Buyer to return the original type of collateral in exchange for a substitute. In return for this permission, the Seller will usually agree to pay a higher repo rate. Where there is more than one permission to substitute, the exercise of the second and any subsequent permissions will result in the substitution of previous substitutes. See paragraphs 4.19-4.23 below.
- 2.30 Permission to substitute will typically be agreed at the point of trade of each transaction. It is best practice to record the original number of permissions in the initial Confirmation and/or affirmation of the transaction and to confirm and/or affirm each substitution as it takes place, noting the number of permissions remaining.

Best practice recommendation. It is best practice to record the original number of agreed permissions to substitute collateral in the initial Confirmation and/or affirmation of a transaction and to confirm and/or affirm each substitution as it takes place, noting the number of permissions remaining.

Agreeing interest rates for late payments

- 2.31 When negotiating permissions to substitute, it is necessary to agree:
- The total number of substitutions to be allowed.
 - The deadline for the Seller to give notice of substitution for earliest delivery.
 - The periods for the return of collateral and the delivery of the substitute.
 - Whether substitute collateral should have at least the same market value or nominal value as the collateral being substituted. In GMRA (8(a)), Market Value is prescribed.
 - To the extent possible, what are acceptable and/or unacceptable substitute securities (see paragraph 4.20-4.21 below).
 - Whether partial substitution will be allowed and whether there is a minimum size of substitution.
- 2.32 The standard provision in the GMRA 2000 (paragraph 12) is that the interest rate on late payments should be the higher of the repo rate on a particular transaction or 1-month LIBOR (which, if not already amended, will need to be replaced before calculation and publication of that index ceases). However, parties are free to agree another rate. In this case, it is best practice for the parties to agree such a rate before trading and to record this rate in Annex I of their GMRA. In the GMRA 2011, the default rate is the higher of the repo rate on a particular transaction and an agreed 'Applicable Rate', which should be recorded in Annex I. It is best practice for parties to agree an interest rate on late payments that reflects only the need of the party suffering late payment for reasonable economic compensation. The interest rate on late payments should not be used to penalise the other party.
- Best practice recommendation.** Where parties decide to agree an interest rate to apply to late payments, it is best practice to do so before trading and to record the rate in Annex I of their GMRA. It is also best practice for parties to agree an interest rate on late payments that reflects only the need of the party suffering late payment for reasonable economic compensation. The interest rate on late payments should not be used to penalise the other party.
- 2.33 Where a late payment by one party has caused the cash account of the other party at its settlement agent to go into deficit and suffer an overdraft charge, some parties try to pass that charge back to the first party, regardless of the fact that the parties have accepted the standard relevant provision of the GMRA. If parties to a repo wish to be able to pass on overdraft charges incurred because of a late payment by their counterparties, it is best practice (and a legal necessity) to include a supplementary term to this effect in Annex I of their GMRA or, if that is not practicable, in Confirmations. However, overdraft charges vary widely between parties and, given that settlement agents report on a net basis, it is typically not practicable to apportion overdraft charges to individual transactions. This creates uncertainty over the cost of failing, which is a risk that could cause some parties, particularly lenders of securities, to

withdraw from the repo market, thereby damaging market liquidity. It is preferable that parties use a pre-agreed formula applying definite rates of interest. It is recommended that the failing party should pay the highest interest rate from the following:

- The accepted overnight index for the Contractual Currency (eg ~~EONIA~~ ~~€STR~~ for EUR and SONIA for GBP).
- The central bank deposit rate.
- The repo rate on the failed transaction.

In the case of late payment on negative rate repos, a similar problem arises, on which, see paragraphs 2.~~80~~~~68~~-2.~~81~~~~69~~ below.

Best practice recommendation. If a party to a repo wishes to be able to pass on overdraft charges incurred at a settlement agent because of a late payment by the other party, it is best practice to do so by including a supplementary term to this effect in Annex I of their GMRA or, if that is not practicable, in Confirmations. It is also recommended that the failing party pays the highest interest rate from: the overnight index for the Contractual Currency; the relevant central bank deposit rate; and the repo rate on the failed transaction.

Verifying the terms of transactions

- 2.34 Once a transaction has been agreed, it is best practice for each party to verify that its understanding of the terms of the transaction is the same as that of the other party. A post-trade process of verification should be performed promptly after the execution of a contract, which means as soon as possible on the same day. Prompt same-day verification is required in order to provide the maximum opportunity to correct any mistakes made in recording the terms of a transaction or resolve any disagreements over the agreed terms, if necessary, by agreeing to terminate the transaction, as well as to assist in the detection of fraud. Such promptness is particularly essential in order to be able to verify the details of transactions requiring overnight settlement. The later that mistakes or disagreements are discovered, the more difficult and expensive it will be to repair and reprocess transactions. Until mistakes or disagreements are identified and addressed, the parties will be exposed to unexpected market and liquidity risks. Regulators are pressing for record-keeping to be accurate and complete on the transaction date, in order to improve risk management by firms and to allow more effective prudential supervision. Verification of the terms of a transaction can be done by means of Confirmation and, if necessary, affirmation.⁴

⁴ Confirmation and affirmation should not be confused with trade-matching. Where parties use custodian banks as settlement agents, the latter will compare the details of instructions for settlement sent by or on behalf of the counterparties, usually on the intended settlement date (S) or the day before (S-1) or close to real-time in the case of ICSD. This process of **trade-matching** or **settlement matching** is intended to ensure that transactions will not fail to settle after they have been entered into the security settlement system at a CSD or ICSD merely because of mismatches between the instructions entered by or on behalf of the parties. It is not good practice for parties to rely on trade-matching at the security settlement system for the verification of the terms of transactions, as this usually reduces the time to correct mistakes or resolve disagreements about the terms of transactions and allows a build-up of risk.

- 2.35 A **Confirmation** is a complete statement of the key economic terms and conditions of a trade plus a list of the required settlement addresses of the parties (their locations or those of their settlement agents as well as settlement account numbers). Parties will exchange Confirmations or, by agreement, only one will send a Confirmation to the other. The recipient of a Confirmation should match the information provided against his own records, identify any mistakes or misunderstandings and inform the sender. Confirmations therefore play a critical role in risk and operations management by ensuring that both parties to a trade have recorded an identical contract, that the trade settles in the right place and, by highlighting any disagreement at an early stage minimise the unexpected exposure and maximise the time to resolve the problem, if necessary, by cancellation.
- 2.36 The GMRA envisages that one or both parties will generate and send a Confirmation to the other, and will do so promptly, in writing and (unless otherwise agreed) in English, using one of the forms of communication listed in the agreement (paragraph 14). Confirmations are an integral part of the contract between two parties and, unless promptly queried, constitute (together with the agreement) prima facie evidence of the terms and conditions of a new trade.
- 2.37 Unless both parties exchange Confirmations, disagreements about the terms of a transaction will likely emerge too late to be resolved before the settlement date, creating uncertainty about the terms of the contract and the risk to which the parties are exposed. In contrast, where it has been agreed that Confirmations will be exchanged, any problem should automatically become apparent to both parties, as both will be expecting to receive a Confirmation. In such circumstances, a party not receiving, or claiming not to have received, a Confirmation by the end of the transaction date could reasonably have been expected to request the other party to resend the Confirmation (in fact, this is best practice --- see the next paragraph). Where a party agrees that its counterparty does not have to send a Confirmation, it is best practice for it to affirm at least these transactions.
- 2.38 Where both parties have agreed to send Confirmations, if one party does not receive a Confirmation from the other party, the first party should not assume that the second party has accepted the first party's Confirmation. It is possible that the second party sent a Confirmation, but communications were disrupted. It is best practice for the first party to prompt the second party to send or re-send a Confirmation or seek to affirm the relevant transaction.

Best practice recommendation. Where both parties have agreed to send Confirmations, if one party does not receive a Confirmation from the other, it is best practice for the first party to prompt the second party to send or re-send a Confirmation or seek to affirm the relevant transaction.

- 2.39 Parties should have in place clear, documented and tested policies and procedures to efficiently manage outgoing and incoming Confirmations. Confirmations should be sent as soon as possible after the execution of a transaction and, depending on what has been agreed with the other party, either the recipient should check receipt of the other party's Confirmation or it should seek affirmation of transaction details. Incoming Confirmations should be promptly checked against books and records and, if necessary, queries promptly sent to the sending parties. It is best practice to automate the sending and checking of Confirmations, possibly using third-party service-providers. Where parties select a service-provider, they should ensure that matching is possible of all the relevant details of new repos and life-cycle events, as well as data fields required to be matched for dual-sided regulatory reporting. Parties should also require interoperability between their provider and others in order to maximize the scope for the automation of Confirmation matching. Until full automation is achieved, parties could consider prioritizing the checking of incoming Confirmations in terms of age, urgency, value and other risk parameters (but automation is best practice). Confirmation management should include policies and procedures for efficiently resolving queries received on outgoing Confirmations and queries sent about incoming Confirmations. For queries that cannot be resolved quickly, there should be a clear and well-structured process for escalating queries to higher levels of management within defined deadlines. The person at the top of the escalation ladder should have the authority to cancel transactions. Parties should provide each other and keep updated contacts for dealing with Confirmation queries. Special contacts could be provided for queries about Confirmations of aged and high-value transactions. A key feature of Confirmation management policy should be the monitoring, recording and regular analysis of queries in order to identify internal operational weaknesses, including inefficiencies in Confirmation management policies and procedures, or problems with counterparties or third-party service-providers.
- 2.40 The GMRA lists the essential fields to be included (GMRA 3(b)) and offers a non-definitive form of Confirmation notice (Annex II). The recommended fields are:
- transaction date
 - collateral (including ISIN or other identifying code)
 - nominal value of collateral
 - precise legal identities of the Buyer and Seller
 - Purchase Date
 - Purchase Price and its currency
 - Repurchase Date or confirmation that the transaction is an open repo
 - where the Buy/Sell-Back Annex has been applied, confirmation of whether the transaction is a repurchase transaction or sell/buy-back
 - repo rate (Pricing Rate) in the case of a repurchase transaction or forward price in the case of a sell/buy-back
 - settlement instructions, including the bank accounts of the Buyer and Seller
 - where the Agency Annex has been signed, confirmation of whether the transaction is an agency transaction or between principals and, if it is an

agency transaction, which party is the agent and the identity of the principal(s) for whom the agent is acting: the identity of the agent's clients can be revealed in terms of their names or, for reasons of commercial sensitivity, using a code agreed with the credit, compliance or other non-trading department of the counterparty

- any additional terms.

- 2.41 In addition to contractual obligations and best practice, there may be legal and regulatory requirements applicable to Confirmations. For example, UK regulators require Confirmations to reference the sender's FCA and PRA authorisation; there could be a local legal requirement to obtain consent in order to send Confirmations by e-mail; and banking and data protection law may require a secure method of transmission.
- 2.42 It is recommended that Confirmations should be sent as soon as possible on the transaction date, both for new trades and for material changes to the terms and conditions of existing trades (see paragraph 4.26 below). In addition, subject to applicable laws and regulations, Confirmations should be made through an electronic communication system agreed between the parties or, in the absence of such an agreement, such electronic medium as the party who is under an obligation to confirm may choose, provided that the Confirmations are capable of being promptly and accurately reproduced on paper.
- 2.43 It is best practice for transactions to be confirmed and, if desired, affirmed by the operations departments of the parties, not by their trading desks. This is in order to ensure the proper segregation of functions.

Best practice recommendation. It is best practice for each party to verify that its understanding of the terms of a transaction is the same as the other party's by means of Confirmation and, if necessary, affirmation. Verification should be performed promptly after the execution of a contract, which means as soon as possible on the same day. Subject to applicable laws and regulations, such Confirmation should be made through an electronic communication system agreed between the parties or, in the absence of such an agreement, such electronic medium as the party who is under an obligation to confirm may choose, provided that the Confirmation is capable of being promptly and accurately reproduced on paper. Parties should promptly compare a Confirmation received from the other party with their own records and revert to the other party urgently, on the transaction date, if there are any differences. It is best practice to affirm all transactions where only one party is obliged to send Confirmations. Transactions should be confirmed by operations departments, not by trading desks.

- 2.44 Confirmations sent close to the close of business in the receiving party's location may arrive too late to be checked on the same day. In the case of riskier transactions (eg large deal size) or more complicated transactions (eg evergreen

repos), it is recommended that the party sending the Confirmation makes the receiving party aware that the Confirmation has been sent, so that, if necessary, special arrangements can be made to have that Confirmation checked the same day. The sending party should seek positive affirmation from the receiving party that they have been made aware of the Confirmation.

- 2.45 Where one party disagrees with the details in a Confirmation received from the other, it should promptly communicate its query to the other party and provide sufficient detail to allow the other party to understand the reason for the query.
- 2.46 It is best practice for parties to confirm both legs of a repo on the transaction date, rather than confirm the second leg separately from the first leg and to delay the second Confirmation until shortly before the Repurchase Date. Dual Confirmation avoids the risk of the second Confirmation being forgotten. However, the second leg cannot be confirmed in the case of floating-rate and open repos. In the case of these types of repo, the parties should consider sending two Confirmations. The first would be sent on the transaction date, confirming the details of the first leg and all the details of the second leg excluding the repurchase price and, in the case of open repos, the repurchase date. The second would be sent on the repurchase date, setting out the remaining details. However, this double Confirmation process is unlikely to be practicable unless the generation and matching of Confirmations is automated, which is therefore an objective to which parties should be committed.

Best practice recommendation. In the case of sell/buy-backs, it is best practice for parties to confirm both legs on the transaction date.

- 2.47 The question arises as to whether bilateral Confirmations are necessary where parties have provided sufficient information to a financial market infrastructure involved in the execution, clearing or collateral management of a repo (ie an automatic trading system, CCP or triparty agent). Where such a financial market infrastructure is in possession of the key economic terms of a trade and has a record of the settlement arrangements between the parties (typically in the form of standard settlement instructions), it would be in a position to match this information and render bilateral Confirmation redundant, which would represent a significant economy for parties.
- 2.48 Table 3 below lists the alternative types of repo and offers an assessment of which types are unlikely to permit delegation of Confirmation to a financial market infrastructure. Each type of repo is a unique sequence of the three stages involved in the creation and consummation of a trade:
- Execution – the negotiation and formation of the contract - was the trade negotiated directly by the two counterparties (possibly with the use of a voice-broker) or traded across an automatic trading system (ATS).
 - Clearing – the netting of offsetting trades - is this process bilateral and subject to a master agreement such as the GMRA, or is the trade cleared

across a central counterparty (CCP), either automatically or after a post-execution 'give-up' to the CCP.

- Collateral management – initially, the selection of collateral - is selection agreed bilaterally between the counterparties or has the decision been outsourced to a tri-party agent.

However, financial market infrastructures vary significantly in how they operate. So, where it is indicated in Table 3 that bilateral Confirmation could perhaps be replaced by matching by a financial market infrastructure, parties need to check whether the particular infrastructures which they employ possess and match all the information that is required for bilateral Confirmation.

Table 3: Overview of repo trade initiation chains

Link in trade initiation chain			Description	Do parties have to confirm?	Notes
execution	clearing	collateral management			
direct or brokered	bilateral under master agreement	bilaterally-agreed	Traditional OTC trading. Between two counterparties where trade is negotiated by telephone, by e-mail, on Bloomberg or other automated trading system, through a broker, etc. No CCP is involved and collateral management is down to the parties.	YES	Note that structured trades require bespoke addendums (effectively long form confirmations) that are signed, returned and archived.
direct or brokered	post-trade give-up to CCP	bilaterally-agreed	CCP give-up trades. Direct or brokered trades (as above) but submitted post-trade to a CCP for clearing, e.g. to LCH via ETCMS, to CC&G via MTS. Trade may be conditional on registration by CCP.	NO: provided there is no interval between execution & registration and the CCP cannot refuse to register a trade.	If there is any possibility of the processing of a trade being interrupted before submission to a CCP, there is a risk that the parties could be left with a bilateral trade for which confirmation is always recommended. The same risk applies if a CCP is able to refuse registration, perhaps because the details of the trade received from the parties do not match. Even if trades to be given up to a CCP are executed subject to registration by the CCP, confirmation is still useful in order to be able to discover the reason for any refusal by a CCP.

direct or brokered	bilateral under master agreement	triparty agent	Traditional European triparty repo. Direct or brokered trades (as above) but collateral management mutually delegated to agents such as Euroclear and Clearstream. No CCP involved.	YES	There is a risk that for any trade that is negotiated by telephone or electronic messaging that the parties may not have agreed on all the terms. Note that structured trades, which often employ triparty collateral management, require bespoke addendums (effectively long form confirmations) that are signed, returned and archived.
ATS	bilateral under master agreement	bilaterally-agreed	Sometimes called bilateral electronic trading . Trading on fully automatic platforms (ATS) such as BrokerTec, MTS, Eurex, tpRepo. ATS has no role in instructing settlement. No CCP involved.	NO: provided power of attorney to instruct settlement is given to the ATS.	If the ATS is given power of attorney to instruct settlement, it will have settlement addresses as well as the terms of the trade, and will therefore be in a position to match all key fields.
ATS	bilateral under master agreement	triparty agent	Electronic triparty repo. Trade negotiated on ATS, which submits to triparty agent for collateral management using power of attorney from parties. No CCP involved, e.g. SIX Repo	NO	
ATS	CCP	bilaterally-agreed	Standard electronic trading, sometimes called anonymous electronic trading . ATS is linked to CCP, which ensures original parties have anonymity. ATS or CCP has power of attorney to instruct settlement.	NO	
ATS	CCP	triparty agent	GC pooling or financing. Trade negotiated on ATS, which is linked to CCP, which is linked to triparty agent. CCP has power of attorney to instruct settlement, e.g. Eurex EGCP, €GC+	NO	

2.49 Where a bilateral Confirmation could be replaced by matching by a financial market infrastructure, some customers may still wish to receive Confirmations for their records.

- 2.50 The chart below sets out a decision tree to illustrate the assessment of whether a financial market infrastructure is likely to have and be able to match the same information as would normally be sent in a bilateral Confirmation.
- 2.51 In addition to the bilateral Confirmation or matching of new trades, there are a number of possible post-trade events during the life of a repo that should be bilaterally confirmed or might be matched by a financial market infrastructure. These are summarised in Table 4. The general rule on whether to bilaterally confirm or otherwise match a post-trade life-cycle event is whether it results in a material change in the economic terms of the trade.
- 2.52 Some life-cycle events can result in a new trade. In these cases, it is best practice to cross-reference the terminated and new trades in a bilateral Confirmation of the new trade, using the trade identifier code of the terminated trade.
- 2.53 Some life-cycle events may be confirmed bilaterally using processes and systems that are separate from the process and system that generated the original Confirmation. This is likely to be the case for:
- margin payments, transfers and substitution of margin securities;
 - corporate events;
 - compensatory payments.

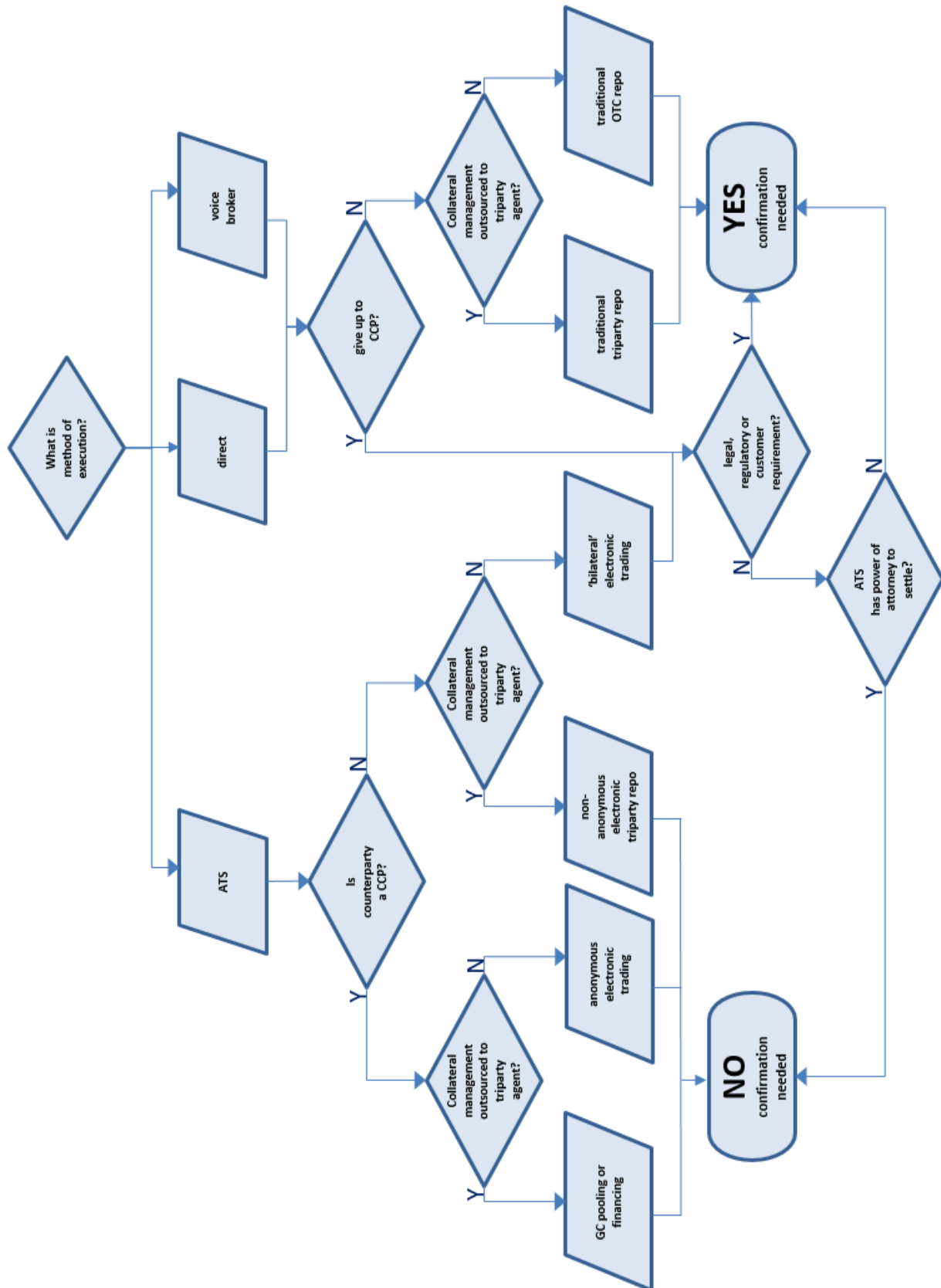


Table 4: Overview of repo trade lifecycle events

Life-cycle event	Is Confirmation required?	Notes
early termination of open, evergreen repo	YES	
extension of extendible repo	YES	
rerating of open, evergreen repos	YES	
increase/decrease of open repo	YES	If this event results in the booking of a new trade, the bilateral Confirmation of the new trade should reference the trade identification code of the terminated traded.
rerating of floating-rate repos	YES	
rerating of index-linked/floating-rate collateral	YES	
rolling a trade (close and reopen)	YES	The bilateral Confirmation of the new trade should reference the trade identification code of the terminated traded.
confirming collateral on forward repo	YES	
Repricing/Adjustment under GMRA 2000 4(j) & 4(k) or GMRA 2011 4(k) & 4(l)	YES	The bilateral Confirmation of the new trade should reference the trade identification code of the terminated traded.
substitution of collateral	YES	If this event results in the booking of a new trade, the bilateral Confirmation of the new trade should reference the trade identification code of the terminated traded.
margin maintenance payments/transfers	NO	Advance notice and subsequent reporting will be provided but this is a different process to Confirmation.
manufactured payments	NO	
corporate events	NO	

Best practice recommendation.

- Repos should always be confirmed bilaterally unless a financial market infrastructure involved in processing trades has sufficient information to match the trade details and settlement addresses, subject to legal, regulatory and customer requirements.
- Post-trade life-cycle events should be confirmed bilaterally where they make a material change to the economic terms of trades.
- Where life-cycle events result in a new trade, it is best practice to cross-reference the terminated and new trades in the Confirmation of the new trade using a trade identifier for the terminated trade.
- Parties should seek to automate the generation and checking of bilateral Confirmations wherever possible.

2.54 Affirmation is a process in which (1) one party contacts the other by telephone or e-mail on the transaction date, as soon as possible after the execution of a transaction, in order to secure immediate verification from the other party of at least the key economic terms of a transaction and the settlement addresses, or (2) both parties report batches of transactions to a third-party affirmation service for automatic comparison. Affirmation is usually performed where the prompt checking of all Confirmations is not practicable.

2.55 Because affirmation by telephone or e-mail is a manual process, it is not practicable to affirm all transactions or events. Instead, such bilateral affirmation is applied only to certain counterparties or to riskier transactions. Thus, an affirmed transaction may include riskier collateral, larger size, longer duration, floating-rate repos or complicated structures requiring economic decisions to be made in the future or may be with a riskier counterparty. Automated third-party affirmation services should make it possible to affirm all repos, which could transform the affirmations into Confirmations.

2.56 Typical terms to be affirmed are:

- transaction date
- Purchase Date
- Repurchase Date or whether the repo is open
- collateral (ISIN)
- nominal value of collateral
- market value of collateral
- Purchase Price
- repo rate or (for open and floating-rate repos) interest rate index and spread
- currency of Purchase Price
- counterparty
- buy or sell
- settlement account

- 2.57 Affirmation (like Confirmation) can also be used during the life of a transaction to verify changes. See paragraphs 4.26-4.27 below. Typical changes include:
- refixing the repo rate on a floating-rate repo
 - early termination (eg termination of an open repo, mini close-out, or termination of a transaction where delivery has failed)
 - Repricing or Adjustment of a sell/buy-back
 - change in repo rate (for open repos) or refixing of interest rate or other index (for floating-rate repos and index-linked collateral)
 - ISIN for new collateral after substitution.

Settlement

- 2.58 In order to successfully implement a transaction, both parties or their agents must send accurate and complete instructions for the payment of cash and/or the transfer of securities to their settlement institution in good time for those instructions to be matched and implemented on the intended settlement date. In the case of a repo, a settlement instruction from each party typically needs to be sent for each leg. Delaying instruction of the repurchase leg until closer to the repurchase date reduces the time to correct any problem highlighted by a mismatch at the settlement institution (although Confirmation and affirmation should limit such problems to operations errors). Where a repo has a long term to maturity, there is also the risk that impact of any undetected problem may be compounded during any delay in discovery. In the case of a forward repo, these considerations also apply to the purchase leg. However, it may not be possible to immediately instruct the repurchase leg of a repo, where it is a floating-rate or open transaction, unless the settlement institution allows instructions to be updated. Similarly, it may not be possible to instruct the purchase leg of a forward repo where only the class of collateral securities rather than the specific issue(s) has been agreed at the start (see Annex I, Part 2). It is therefore best practice for parties to instruct settlement of both legs of a repo as soon as possible after execution of the transaction and no later than the end of the transaction date, provided all the settlement details are known at the start or the settlement institution allows instructions to be updated when known. If, for whatever reason, the repurchase leg is not instructed at the same time as the purchase leg, it is best practice for parties to make it clear in the instruction of the purchase leg whether the transaction is for term or is open. It is also best practice for parties to use the :22F indicator field in SWIFT messages, or the equivalent field in other messaging standards, to identify an instruction which is for the settlement of a leg of a repo.

Best practice recommendation. It is best practice for parties to instruct settlement of both legs of a repo as soon as possible after execution of the transaction and no later than the end of the transaction date, provided all the settlement details are known at the start or the settlement institution allows instructions to be updated when known. If the repurchase leg is not instructed at the same time as the purchase leg, parties should try to make it clear in the instruction of the purchase leg whether the transaction is for term or is open. It is also best practice for parties to use the relevant indicator field in instructions to identify the settlement of a leg of a repo.

- 2.59 Standard settlement instructions (SSI) are sets of essential settlement parameters that one party sends to another, including a list of that party's settlement agents for each type of security, their agent's identification codes, their cash and securities account numbers and addresses, and the settlement system for each type of security. The use of SSI facilitates straight-through processing (STP). It is therefore best practice for parties to provide SSI to each other. If an SSI is to be amended, notification of the amendment should be made to other party as soon as possible and well before the intended settlement date.

Best practice recommendation. It is best practice for parties to use standard settlement instructions (SSI).

- 2.60 Settlement instructions should be sent by both parties to their settlement agents or, if they have direct access, direct to the securities settlement system (SSS) as soon as possible after the transaction has been confirmed or affirmed, preferably on the transaction date (always on the transaction date for overnight repos). Early settlement instruction maximises the time available to the parties to resolve any mismatches between their instructions revealed by trade matching at the SSS. ~~A hold-and-release facility allows the parties to make an early submission of settlement instructions into the SSS for the purpose of matching but to hold the instructions back from settlement processing until they are sure that settlement is possible, at which point, they can release the instruction for processing. Hold-and-release facilities should therefore improve settlement efficiency. Instructions being held should be released as soon as possible and in sufficient time to allow settlement. A hold-and-release facility should only be used by the party due to receive securities in exceptional circumstances.~~

- 2.61 A hold-and-release facility allows participants in a CSD to make an early submission of settlement instructions into the SSS for the purpose of matching but to hold the instructions back from settlement processing until they are sure that settlement is possible, at which point, they can release the instruction for processing. Hold-and-release facilities should therefore improve settlement efficiency.

- 2.62 Instructions being held should be released as soon as possible and in sufficient time to allow settlement.
- 2.63 Hold-and-release facilities can be used inappropriately. Their purpose is to reduce settlement failures due to mismatched settlement instructions by allowing early matching of instructions. They should not be used primarily, actively or routinely to manage a firm's aggregate intra-day liquidity by reducing the priority of payments for securities settlement in favour of other calls on intra-day liquidity.
- 2.64 A hold-and-release facility should only be used by the party due to receive securities in exceptional circumstances.
- 2.65 CSDs usually offer a 'partial hold-and-release' facility, allowing early matching of a settlement instruction but permitting the partial release of securities and automating the process of re-instruction and the cancellation of the original instruction. Such a facility is designed to facilitate partial settlement from within omnibus accounts, where otherwise partial settlement may not be used for fear of 'pilfering' the securities of one client to settle the transactions of another. It is best practice for settlement agents to offer partial hold-and-release to clients and encourage its use.
- 2.66 Where partial hold-and-release is used, it is best practice to instruct partial settlement for not less than the minimum tradable amount for the market in the security being settled.

Best practice recommendation. It is best practice to instruct partial settlement for not less than the minimum tradable amount for the market in the security being settled.

- 2.67 ¹ If a settlement instruction is being cancelled unilaterally, the cancelling party should notify its counterparty before cancellation, giving the reasons. The cancellation should be confirmed or affirmed using the same method of communication as the original Confirmation or affirmation. The new Confirmation or affirmation should identify the repo being cancelled and, in order to lay an audit trail, the original Confirmation or affirmation.
- 2.68 ² If a settlement instruction is being amended, other than to correct a mistake by bringing the instruction into line with a counterparty's Confirmation or affirmation, the amendment(s) must first be agreed with the counterparty. The amendment(s) should be confirmed or affirmed using the same method of communication as the original Confirmation or affirmation. The new Confirmation or affirmation should identify the repo being amended, the precise amendment(s) being made and, in order to lay an audit trail, the original Confirmation or affirmation.

Recommended delivery size (shaping)

- 2.69 ~~3~~ It is best practice to divide or 'shape' instructions for the delivery of a large amount of collateral into smaller deliveries or 'shapes', so as to ~~reduce~~ limit the economic impact of settlement failures. Accordingly, it is recommended that parties in the European repo market should agree to shape transactions into multiple deliveries of 50 million in EUR, GBP and USD, and the nearest equivalent in other currencies or the amount mandated or generally accepted in other currencies. Note that shaping does not break up a transaction into smaller contracts. It is a purely operational process. ~~A typical shape in the European market is currently about EUR 50 million or the equivalent in other currencies. However, while partial delivery is helpful in mitigating the economic impact of settlement problems, it does not change the legal obligation on the delivering party to deliver the full agreed amount of collateral. Shaping is therefore different from 'partialling', where the parties have agreed to accept partial deliveries in part fulfilment of their contract. Note that shaping does not break up a transaction into smaller contracts. It is a purely operational process.~~

Best practice recommendation. It is best practice to divide instructions for the delivery of large amounts of collateral into 'shapes'.

Partial delivery

- 2.70 ~~64~~ ~~It is best practice for partial deliveries to be accepted in mini close-outs (see paragraphs 4.2-4.4 below), given that there will be no prospect of further deliveries because of the termination of the transaction, but without leaving an untradeable balance.~~ A partial delivery does not satisfy the contractual obligation of the seller. It just reduces the adverse economic impact of a failure to deliver the full amount. The seller remains obliged to complete full delivery. Partialling should not be confused with *shaping*, which is an operational mechanism by which a large delivery of securities is broken up into smaller deliveries by the seller or his agent. Like partialling, shaping is intended to reduce the economic impact of a failure to deliver. The difference is that partialling is a decision by a buyer and shaping is an action by a seller, its agent or a market infrastructure such as a securities settlement system or a CCP.
- 2.71 It is best practice for partial deliveries to be accepted in mini close-outs (see paragraphs 4.2-4.4 below), given that there will be no prospect of further deliveries because of the termination of the transaction, but without leaving an untradeable balance.

Best practice recommendation. It is best practice to accept partial deliveries in a 'mini close-out' under paragraph 10(h) of the GMRA 2000 or 10(i) of the GMRA 2011 provided partial delivery will not leave an untradeable balance.

- 2.72 65 Where (1) a Seller has failed to complete full delivery to the Buyer on the Purchase Date but the Buyer has not terminated the repo or (2) a Buyer has failed to complete full delivery of collateral to the Seller on Repurchase Date but the Seller has not executed a mini close-out, it is very desirable that the party expecting to receive the delivery should accept partial delivery. Such 'partialling' reduces the economic impact of fails on the counterparty as well as on the liquidity of cash and repo markets. ~~In some securities settlement systems, parties have no choice about accepting partial delivery as the systems automatically partial in the event of delivery failures. Partialling is also encouraged in the European market by the EU Central Securities Depositories Regulation (CSDR). Where there is a choice about accepting partial delivery, it is best practice for parties to agree to do so, provided they would not be disadvantaged by an incomplete delivery (for example, because the Buyer is the intermediary in matching transactions and his other counterparty refuses to partial) and provided that partialling is operationally feasible for both parties. Operational difficulties may arise because a request to partial can only be made once a delivery failure has been discovered and is therefore likely to happen on or shortly before the intended settlement date. The party being asked to accept partial delivery may therefore not have time or the operational capability to reorganise his funding or collateral inventory before the settlement deadline. Or, if the party being asked to accept partial delivery is buying for clients, he may not be able to secure their permission in time. However, market users should make best endeavours to eliminate operational obstacles within their own firm and encourage customers to also accept partial delivery.~~ It also mitigates the cost of penalties for failed settlement. Partialling is a requirement of the Central Securities Depositories Regulation (CSDR) where a mandatory buy-in cannot be completed following failed settlement on an EU CSD, although this requirement is not yet in force.
- 2.73 Partialling tends to be an involved manual process, requiring one party to request and secure agreement to a partial settlement bilaterally and for both parties to then instruct the partial settlement, re-instruct the settlement of the residual quantity of securities, match the new instructions and cancel the original instructions. Operational difficulties may also arise because a request to partial can only be made once a delivery failure has been discovered and is therefore likely to happen on or shortly before the intended settlement date. The party being asked to accept partial delivery may therefore not have time or the operational capability to reorganise his funding or collateral inventory before the settlement deadline. Or, if the party being asked to accept partial delivery is buying for clients, he may not be able to secure their permission in time.

2.74 Partialing has often been resisted by settlement agents operating omnibus accounts, because of the risk of ‘pilfering’ the securities of one client to settle the transactions of another. It may also not be possible in all situations, for example, because the Buyer is the intermediary in matching transactions and his other counterparty refuses to partial.

2.75 However, partialing is a highly desirable means of enhancing settlement efficiency to the benefit of all users of securities markets. It is therefore best practice for parties to agree to accept partial deliveries wherever practicable. Parties should encourage counterparties and settlement agents should actively encourage clients to accept partial delivery. All parties should make best endeavours to eliminate operational obstacles to partial settlement within their own firm, standardizing and automating the process wherever possible.

2.76 If partial delivery is accepted, care must be taken to adjust the relevant records, in particular, where partial delivery is accepted in response to a margin call. It is important to note that agreeing to partial delivery does not remove the rights that parties have under the GMRA to take action in respect of those securities that have not been delivered on time. In particular, agreeing to partial delivery of securities in response to a margin call does not change the fact that the failing party has still committed an Event of Default.

Best practice recommendation. It is best practice for partial deliveries to be accepted whenever there has been a delivery failure, provided that the party expecting delivery would not be disadvantaged by an incomplete delivery and provided that partialing is operationally feasible for both parties. Market users should make best endeavours to eliminate operational obstacles within their own firm and encourage customers to ~~also~~ accept partial delivery.

2.77 Where partial settlement remains a manual process, parties should aim to complete the process as swiftly as possible.

Best practice recommendation. It is best practice for partial settlement to be completed as swiftly as possible.

2.78 CSDs may offer automatic partial settlement facilities, commonly called ‘auto-partial’ facilities. Auto-partial facilities automatically identify the availability of securities for partial settlement and optimize and implement such settlement. As an automatic process, auto-partialing enhances the efficiency of settlement across the market. It is therefore best practice to opt into such facilities where they are offered. Where a party does not opt to use auto-partial facilities, they should make this clear to their counterparties and explain their reasons. Settlement agents should actively encourage their clients to allow use of auto-partialing for the settlement of their instructions. Where parties have the choice, auto-partial settlement should not be for less than the minimum tradeable amount in the market for the security being partially delivered.

Anticipating problems that may be caused by low or negative repo rates

Best practice recommendation. It is best practice for parties to opt into the use of auto-partial facilities at CSDs. Auto-partial settlement should not be for less than the minimum tradeable amount in the market for the security being partially delivered.

- 2.79 ~~67~~ When interest rates are generally positive, repo rates can become negative when a particular collateral asset is subject to exceptional demand and/or reduced supply, and goes special. Very low, zero or negative rates become more common when the general level of interest rates (including the GC repo rate) is low. It is also possible for GC repo rates to become negative during a period of financial stress, where the whole basket of general collateral in a particular collateral market is subject to exceptional demand because the underlying securities, which are typically government securities, are seen by investors as a safe haven. A negative repo rate means that the Buyer (the cash lender) effectively pays repo interest to the Seller (the cash borrower), because the Repurchase Price will be lower than the Purchase Price (see the worked example below). Problems can arise, because the GMRA was designed only with positive repo rates in mind. Parties need to be aware of the potential problems that can be caused by negative repo rates.

Worked example: negative repo rate

Purchase Date	8 August
Repurchase Date	15 August
Repo rate	-0.50%
Purchase Price	EUR 10,000,000

$$\text{Repurchase Price} = 10,000,000 \left(1 + \frac{-0.50 \times 7}{100 \times 360} \right) = 9,999,027.78$$

- 2.80 ~~68~~ If a Seller fails to deliver collateral on the Purchase Date of a repo, he will not receive or be able to retain the Purchase Price until he does deliver. However, the Seller will remain obliged to pay the full amount of repo interest to the Buyer at the Repurchase Date, even if he delivers the collateral late and therefore has delayed use of the cash, or even if he never delivers the collateral and therefore never has use of the cash. Having to pay interest without having the full use of cash is a cost that provides an incentive to the Seller to remedy a failure to deliver, as well as providing compensation to the Buyer.

2.81 At negative repo rates the automatic cost of failing to deliver collateral becomes a perverse incentive to fail. Given that the repo contract remains in force despite a failure to deliver by the Seller (unless the Buyer chooses to terminate the transaction), the Seller is obliged to pay a Repurchase Price to the Buyer on the Repurchase Date but this will now be lower than the Purchase Price which the Buyer was obliged to pay to the Seller on the Purchase Date. Thus, the Seller is rewarded for his failure!⁵ To eliminate the perverse effect of negative repo rates, the ICMA issued a recommendation in November 2004 on behalf of the ERC that, when a Seller fails to deliver on the Purchase Date of a negative rate repo, the repo rate should automatically reset to zero until the failure is cured, while the Buyer has the right to terminate the failed transaction at any time. Subsequently, this recommendation has been included as an optional supplementary condition in Annex I of the GMRA 2011. For parties using the GMRA 2000, it is normally best practice to adopt the ICMA recommendation by an agreed amendment to the GMRA or, if that is not practicable, by inclusion in Confirmations. For parties using the GMRA 2011, it is normally best practice to elect to include the supplementary condition in Annex I.

Best practice recommendation. For parties using the GMRA 2000, it is normally best practice to adopt the ICMA recommendation of November 2004 on failure to deliver in repos at negative rates by an agreed amendment to the GMRA or, if that is not practicable, by inclusion in Confirmations. For parties using the GMRA 2011, it is normally best practice to elect to include the supplementary condition in Annex I.

2.82 For parties transacting high volumes of repos, it may be operationally difficult and costly to identify failing transactions with negative rates and to reset the repo rates on individual failing transactions to zero. Or it may not be possible to reset a negative repo rate to zero on the Purchase Date. In such circumstances, the parties should agree to allow the failed party to retrospectively reclaim any negative repo interest paid to the failing party. The parties should record their agreement in their GMRA or, if that is not practicable, in Confirmations.

Best practice recommendation. Where it is operationally difficult or costly for a party to implement the ICMA recommendation of November 2004 on failure to deliver in repos at negative rates or the equivalent supplementary condition in the GMRA 2011, they should agree to allow the failed party to retrospectively reclaim any negative repo interest paid to the failing party. They should record their agreement in their GMRA or, if that is not practicable, in Confirmations.

⁵ Even at zero or low positive repo rates, there is a perverse incentive on the Seller to fail, inasmuch as a failure to deliver creates a free option on the repo rate. If the repo rate rises before the Repurchase Date, the Seller can cure the fail with collateral borrowed through a separate reverse repo. He will owe interest at the original repo rate on the repo on which he has made late delivery but will receive interest at the new higher rate on the reverse repo.

2.83 Another potential problem caused when a party fails to deliver collateral on a negative rate repo on either the Purchase Date or Repurchase Date is that the other party will find himself with a cash balance that is larger than expected at his settlement agent, who may apply rates to the cash that are much more negative than the repo rate. If the failed party is a Buyer, he will also have been deprived of the use of the collateral securities, which may have been the reason for the transaction. In these circumstances, some failed parties have sought to pass on to failing counterparties the cost of having to retain cash at their settlement agents. However, overdraft charges vary widely between parties and, given that settlement agents report on a net basis, it is typically not practicable to apportion overdraft charges to individual transactions. This creates uncertainty over the cost of failing, which is a risk that could cause some parties, particularly lenders of securities, to withdraw from the repo market, thereby damaging market liquidity. In the case of tri-party repos, some agents have introduced the practice of charging the negative interest to the failing party. However, this may not be the practice at other settlement agents for repos in which collateral is managed bilaterally, in which case it is recommended that the parties agree that the failing party should apply an adaptation of the formula recommended in paragraph 2.30 above (which covers repos at position rates) and pay the highest absolute interest rate (ie the largest number ignoring the arithmetic sign) from the following:

- The accepted overnight index for the Contractual Currency (eg ~~€ONIA~~€STR for EUR and SONIA for GBP).
- The central bank deposit rate.
- The repo rate on the failed transaction.

This formula means that a failing party pays the highest possible cost. For example, in the case of a EUR denominated repo, if ~~€ONIA~~€STR is -36bp, the ECB deposit rate -40bp and the rate on a failed repo was -60bp, the cost of failing would be 60bp.

Best practice recommendation. If a party wishes to claim compensation from the other party, for overdraft charges incurred as a result of the failure of the other party to deliver collateral on a negative rate repo, either the Seller on the Purchase Date or the Buyer on the Repurchase date, it is recommended that the failing party pays the highest absolute interest rate from: the overnight index for the Contractual Currency; the relevant central bank deposit rate; and the repo rate on the failed transaction.

2.84 The reinvestment rate on compensatory income payments in sell/buy-backs at negative repo rates. When a coupon is paid on collateral in a sell/buy-back that is trading at a negative repo rate, an issue arises because, in a sell/buy-back, the compensatory income payment owed by the Buyer to the Seller is deferred until the Repurchase Date. In the interim, the Buyer has to reinvest the value of the coupon. The compensatory payment, including reinvestment interest, is then deducted from the Repurchase Price that the Seller would have had to pay in the absence of an income payment on the collateral. The reinvestment rate is agreed between the parties when negotiating the transaction and incorporated in the Repurchase Price. But if (1) a sell/buy-back is terminated before the Repurchase Date because of a default by one of the parties or (2) the exposure on the transaction is calculated for the purpose of repricing (see paragraph 3.55 below), the reinvestment rate used to calculate the value of the compensatory payment is given in the formula for the Sell Back Price (which is equivalent to the Repurchase Price) in the Buy/Sell-Back Annex of the GMRA (paragraph 2(a)(iii)(y)):

$$(P + AI + D) - (IR + C)$$

where:

P	Purchase Price - ie the clean price of collateral in the case of a sell buy/back (see paragraph 2.7 above)
AI	amount equal to Accrued Interest at the Purchase Date, paid under paragraph 3(f) of the Buy/Sell-Back Annex - ie coupon interest accrued on the collateral security since the last coupon date
D	Sell Back Differential (equivalent to repo interest)
IR	amount of any income in respect of the Purchased Securities payable by the issuer on or, in the case of registered Securities, by reference to, any date falling between the Purchase Date and the Repurchase Date - ie coupons, dividends or other income paid during the term of the repo
C	aggregate amount obtained by daily application of the Pricing Rate (repo rate) for such Buy/Sell Back Transaction to any such income from (and including) the date of payment by the issuer to (but excluding) the date of calculation - ie reinvestment income on the compensatory income payment on the sell/buy-back calculated at the repo rate.

2.85 Given that, in cases of default and margin calculations for sell/buy-backs, the repo rate is used as the reinvestment rate for compensatory income payments, if that rate is negative, reinvestment will erode the value of the equivalent income payment. If the repo rate is negative solely because the collateral is special, it is not appropriate to use it as a cash reinvestment rate. The rate is negative only because it incorporates an implicit borrowing fee reflecting the specialness of the collateral. Cash reinvestment rates should be close to the GC repo rate or some other money market interest rate for the short-term borrowing or lending of cash. Otherwise, the Buyer is paying a hidden, additional fee. However, unless parties to the GMRA agree to amend this formula, they will be obliged to follow it. Where both parties do not wish to apply negative special repo rates as reinvestment rates, they will need to consider incorporating an agreed amendment to their GMRA or, if that is not practicable, including a supplementary term in their Confirmations, to the effect that, in the case of default or calculation of exposure, the reinvestment rate on compensatory payments in sell/buy-backs is never to fall below an agreed GC repo rate or unsecured money market interest rate. Either way, parties need to be aware of the potential problem and, if they believe it necessary, agree on and record an alternative reinvestment rate.

2.86 **Interest on cash margin at negative repo rates.** In paragraph 4(f) of the GMRA, parties holding cash margin are obliged to pay interest “at such rate, payable at such times, as may be specified in Annex I...or otherwise agreed between the parties...” When negotiating their GMRA, parties may agree to use the repo rate on the underlying transaction where that transaction is being margined in isolation. However, the parties need to be aware that the repo rate on a particular transaction can turn negative if the collateral goes on special. As argued in the previous paragraph, it can reasonably be claimed that such a rate is no longer representative of the going rate for cash investment. However, a party cannot unilaterally change the rate previously agreed with its counterparty. Parties therefore need to be aware of the potential problem and, if they believe it necessary, agree on and record an alternative rate. In practice, many parties often use the relevant unsecured overnight index for the currency of the Purchase Price.

Best practice recommendation. Parties need to be aware that a problem may arise if they agree to use the repo rate on a particular transaction as the reinvestment rate for compensatory income payments in sell/buy-backs and the interest rate on cash margin, as that rate may turn negative if the collateral in that particular transaction goes on special. They should therefore consider this possibility and, if they believe it necessary, agree on an alternative interest rate. This should be recorded in Annex I of their GMRA or, if that is not practicable, in Confirmations.

- 2.87** If parties have contractually agreed to use a particular interest rate index as the reinvestment rate for cash margin, income payments in sell/buy-backs or for any other purpose connected with a repo, in the event that the index turns negative, neither party may refuse to apply that rate merely because it has become negative. Dissatisfied parties must seek the express agreement of the other party if they wish to change the reference index. However, in a general negative interest rate environment, there are unlikely to be alternative indices that are still positive. And, while negative interest rates are historically rare, parties must accept that the occurrence of negative rates is beyond the control of their counterparties and that both sides of a transaction are equally likely to have to pay negative rates. It would therefore be unreasonable to insist on receiving positive rates in a negative interest rate environment.

- 2.88** In the case of floating-rate repos linked to an unsecured overnight interest rate index (OI) or tom/next (TN) interest rate index, interest is not paid during the term of the repo but is accrued until the final Repurchase Date. Nor is daily interest compounded. Instead, an arithmetic average is calculated. For a floating-rate repo with a day count of n :

$$\text{Repurchase Price} = \text{Purchase Price} \times \left(1 + \frac{\left(\frac{(R_1 \times D_1) + (R_2 \times D_2) + \dots + (R_n \times D_n)}{n} \right)}{100 \times B} \right)$$

where:

R₁	is the per annum index fixing for day 1
R₂	is the per annum index fixing for day 2
R_n	is the per annum index fixing for day n
D₁	is the number of days to which index fixing R ₁ applies (normally 1 for a weekday and 3 for a weekend)
D₂	is the number of days to which index fixing R ₂ applies
D_n	is the number of days to which index fixing R _n applies
n	is the number of days in the term of the transaction (ie day count)
B	is the annual basis (ie assumed number of days in the year)

- 2.89** Where the term of a repo crosses one or more non-Business Days, the OI fixing on the last Business Day is applied to the non-Business Day(s). For example, Friday's fixing will be applied to the Saturday and Sunday of a normal weekend.

Calculating floating-rate repo interest payments

- 2.90 The Repurchase Price of a floating-rate repo linked to an OI cannot be paid until the final OI is fixed. The problem is that OI are published after close of business, which may be too late to send settlement instructions to the appropriate CSD or ICSD in time for settlement on the Repurchase Date. If the fixing of the OI is not too late, then Method 1 (ultimate day crystallisation) is used. In Method 1, the sequence of ~~EONIA~~ESTR fixings is said to be ‘crystallised’ into a fixed rate on the Business Day before the Repurchase Date (R-1). Method 1 is best practice where practicable.

Worked example of Method 1 for 1W EUR 100 million repo at ~~EONIA~~ESTR flat

	day count	EONIA ESTR fixing	EONIA ESTR applied	payment	
Thu 01-Dec	1	1.10%	1.10%		
Fri 02-Dec	3	1.05%	1.05%		
Mon 05-Dec	1	1.03%	1.03%		
Tues 06-Dec	1	1.02%	1.02%		
Wed 07-Dec	1	0.95%	0.95%		crystallisation day
Thu 08-Dec				20,138.89	

$$\text{Repurchase Price} = 100,000,000 \left(1 + \frac{\left(\frac{1.10 + (1.05 \times 3) + 1.03 + 1.02 + 0.95}{7} \right) \times 7}{100 \times 360} \right)$$

$$= 100,020,18.89$$

- 2.91 If the fixing of the OI is too late to send settlement instructions to the appropriate CSD or ICSD in time for settlement on the Repurchase Date, then Method 2 (penultimate day crystallisation) below is used. In the past, Method 2 tended to be used in the cross-border market, where it has not always been possible to send instructions to the CSD or ICSD on the Business Day before the Repurchase Date (R-1, where R is the Repurchase Date) in time for settlement on the Repurchase Date. Instead, the OI fixing on R-2 is also applied to R-1.

Worked example of Method 2 for 1W EUR 100 million repo at ~~EONIA~~ESTR flat

	day count	EONIA ESTR R fixing	EONIA ESTR applied	payment	
Thu 01-Dec	1	1.10%	1.10%		
Fri 02-Dec	3	1.05%	1.05%		
Mon 05-Dec	1	1.03%	1.03%		
Tues 06-Dec	1	1.02%	1.02%		crystallisation day
Wed 07-Dec	1	0.95%	1.02%		
Thu 08-Dec				20,333.33	

$$\text{Repurchase Price} = 100,000,000 \left(1 + \frac{\left(\frac{1.10 + (1.05 \times 3) + 1.03 + (1.02 \times 2)}{7} \right) \times 7}{100 \times 360} \right)$$

$$= 100,020,333.33$$

- 2.92 Note that, in the example above of Method 2, the fixing on 7 December is not
80 used as the final fixing. Instead, the fixing on 6 December is repeated. The latter is said to be the 'crystallisation day'.

Best practice recommendation. It is best practice, when calculating the Repurchase Price of a floating-rate repo linked to an overnight index, to apply the rates fixed and published for each and every Business Day, rather than repeating the previous day's fixing for the last day. However, this may not be practicable where indices are published late on the Business Day to which they apply or on the next Business Day, because of the resulting delay in instructing settlement of the repurchase leg. In this case, the previous day's fixing will have to be repeated for the last day.

- 2.93 It is best practice for parties to record the agreed method of calculating the
81 Repurchase Price of an overnight floating-rate repo in Annex I of their GMRA or, if that is not practicable, in Confirmations.

Best practice recommendation. It is best practice for parties to record the agreed method of calculating the Repurchase Price of an overnight floating-rate repo in Annex I of their GMRA or, if that is not practicable, in Confirmations.

2.94 Under Method 2 (penultimate day crystallisation), there will obviously be a discrepancy between the Repurchase Price that is calculated and settled by the parties, and the Repurchase Price that would have been paid had it been possible to apply the correct fixings for each and every day (using Method 1 or ultimate day crystallisation). Given the typical size of day-to-day movements in OI, such discrepancies are usually insignificant, particularly for very short-term transactions, and may be written off by the parties. However, where this is not be the case, parties may agree to make a retrospective reimbursement for any difference between the actual and correct Repurchase Prices. It is best practice for this procedure to be agreed at the point of trade and to document this agreement and the deadline for reimbursement, if necessary, in the Confirmation of the transaction, and for any reimbursement to be made immediately following the Repurchase Date. In any event, reimbursement should be made no later than 30 days after the Repurchase Date. It is also recommended that, where several reimbursements are to be claimed on the same day, a single net amount should be claimed from a counterparty, rather than separate amounts for each transaction. The net claim per day per counterparty should not be for less than about EUR 500 or the approximate equivalent in other currencies. Note that this claim is external to the settlement of the underlying repos and does not amend the settlement instructions. Such claims are not be reportable under the EU SFTR.

2.95 A number of OI have or will be changing to next-day publication, eg SONIA, €STR and transitional ~~EONIA~~ ~~€STR~~. This implies wider use of Method 2 (penultimate day crystallisation), which has not previously been recommended as best practice because of the high operational cost of making claims for retrospective reimbursement of what are often small amounts. Consequently, notwithstanding paragraph 2.82 above, it has been recommended by the European Repo and Collateral Council (ERCC) that the interdealer market in Europe should refrain from trading floating-rate repos indexed to OIs. However, it is recognized that such business is likely to continue between dealers and their customers.

Best practice recommendation. Because of the high operational cost of making small claims for the retrospective reimbursement of discrepancies between assumed and actual fixings, the interdealer market in Europe should refrain from trading floating-rate repos indexed to OIs.

Best practice recommendation. Where the Repurchase Price of a floating-rate repo indexed to an overnight index has to be calculated before the fixing and publication of the final rate and the parties decide to make retrospective reimbursements for any difference between the actual and correct Repurchase Prices, it is best practice to document this agreement and the deadline for reimbursement in the Confirmation of the transaction, and for any reimbursement to be made on the Business Day immediately following the Repurchase Date, but no later than 30 days afterwards. Where several reimbursements are to be claimed on the same day, a single aggregate claim should be made, rather than separate claims for each transaction. The aggregate claim per day should not be for less than about EUR 500 or the approximate equivalent in other currencies.

2.96 If a TN index is used instead of an OI, because a TN rate is fixed one day in
84 advance of the day to which it applies, there is no problem about sending the necessary settlement instructions to the relevant CSD or ICSD in time for the repurchase to be made on the Repurchase Date. Therefore, only Method 1 (ultimate day crystallisation) should be used.

2.97 Some floating-rate repos are linked to term indexes such as LIBOR (other than
85 the ON or TN LIBOR indexes) and EURIBOR. In contrast to repos linked to OI or TN indexes, it is convention to pay the repo rate at the end of each floating interest rate period. For example, a repo indexed to 3-month LIBOR would conventionally pay repo interest at the end of every three months. The convention for fixing the Repurchase Dates of floating-rate repos is described in paragraph 2.19 above).

Calculating open repo interest payments

2.98 An open repo rate will not change unless and until the parties agree a new rate.
86 Either party may propose a change in the rate. Agreement to update the repo rate (often called 're-rating' the repo) must be made before the agreed deadline for termination of the transaction (see paragraph 2.20 above) in order for the change in rate to take effect as soon as possible. Parties should have in place procedures to monitor the repo rates being applied to open transactions in order to ensure that these rates are current. It is therefore best practice to regularly update repo rates on open transactions.

Best practice recommendation. It is best practice to monitor the rates being applied to open repos and to regularly update those rates.

2.99 It is best practice to confirm or affirm agreed changes in the repo rate on open
87 transactions (see paragraphs 2.58 above and 4.26-4.27 below).

Best practice recommendation. It is best practice to confirm or affirm changes in the repo rate on open repos.

- 2.10 Unless otherwise agreed, the interest on an open repo accrues daily until
088 payment without compounding.

Worked example: calculating the interest on an open repo

Consider an open repo with a Purchase Price of EUR 10 million that runs from Tuesday, 6 August, to the following Thursday, 15 August (seven business days but nine calendar days). The initial repo rate is 0.75% but this is changed on Monday to 0.55%. The total interest due on the repo is:

$$= 10,000,000 \left(\frac{0.75 \times 1}{100 \times 360} + \frac{0.75 \times 1}{100 \times 360} + \frac{0.75 \times 1}{100 \times 360} + \frac{0.75 \times 3}{100 \times 360} + \frac{0.55 \times 1}{100 \times 360} + \frac{0.55 \times 1}{100 \times 360} + \frac{0.55 \times 1}{100 \times 360} \right) = 1,708.33$$

- 2.10 In the case of open repos that run for extended periods, it is best practice to
189 monitor the repo interest that has accrued and to ensure that the amount of accrued interest is kept within acceptable limits by means of occasional payments. Payments of accrued repo interest (sometimes referred to as the “cleaning up” of accrued interest) can be triggered in a number of ways. One party can request the other to make a payment. Alternatively, one party can terminate and, with the agreement of the other party, simultaneously re-arrange the transaction at the previous purchase price (permitting a pair-off between the old and new repos). Calling a re-rate may also be a way to trigger a payment if, as is common practice, when negotiating the repo, the parties agreed to clean up interest when re-rating.
- 2.10 As a safeguard, parties to an open repo should agree a regular payment
290 frequency, for example, within an agreed number of Business Days after the end of each calendar month, possibly subject to a limit which would trigger an immediate payment at any time during a month and a threshold below which end-of-month payments would be deferred to the end of the next month. This frequency should not be longer than quarterly. A regular payment frequency will also ensure that parties do not forget to periodically check the repo rate on open repos and consider whether to ask for a re-rate. And such an arrangement will allow parties to an open floating-rate repo who are subject to the EU SFTR to report the payment frequency of the repo, which is represented by mandatory matching data fields.

Best practice recommendation. In the case of open repos that run for extended periods, it is best practice to monitor the repo interest that has accrued and to ensure that the amount of accrued interest is kept within acceptable limits by means of occasional payments in order to limit exposure and reveal incorrect accruals. Parties should consider pre-agreeing a regular payment frequency subject to a limit which would trigger an immediate payment and a threshold below which payments would be deferred to the next scheduled payment date.

Netting

2.10 ~~391~~ 'Netting' is the term commonly used to describe the process of reducing the size of credit exposures, as well as the flows of payments and transfers between two parties by offsetting opposite and simultaneous obligations to make payments in the same currency or deliveries of the same security. Netting reduces the size of:

- payment and settlement flows and therefore the cost and risk of settlement;
- balance sheets, depending on applicable accounting rules, which may impact regulatory metrics including those for some liquidity ratios, e.g. NSFR;
- the credit and liquidity consequences of default by a counterparty (when obligations to make payments or transfers of securities will be accelerated, obligations to transfer securities will be converted into monetary values and all sums will be converted into the same currency).

In some circumstances, the use of netting for operational and settlement risk management purposes may reinforce netting rights for legal purposes (e.g. set-off in insolvency).

2.10 Netting reduces the mutual obligations of two parties to a single obligation.
492 Netting is a feature of some statutory insolvency regimes but participants in the repo market prefer contractual 'close-out netting' under legal agreements such as the GMRA, which achieves bilateral netting between the two parties, or by agreement to clear transactions through a CCP, which achieves multilateral netting between all members of the CCP. Netting is essential for the efficiency and stability of the repo and other financial markets. It is the basis on which collateralisation works at the level of individual repos, whereby the risk of lending cash (securities) is offset by the value of the collateral (cash) received in exchange. It also reduces (1) the risk within a repo book by offsetting opposite exposures across multiple transactions with the same counterparty and (2) across different types of transactions between the same parties, eg between the post-default close-out amounts under the GMRA and under an ISDA Master Agreement. As new or increased regulatory charges add to the balance sheet cost to banks and securities dealers of extending credit and liquidity, the ability of firms to transact repo with each other and with customers increasingly depends on the maximum use of netting. It is therefore best practice for parties to co-operate to maximise both bilateral and multilateral netting opportunities.

Best practice recommendation. It is best practice for parties to co-operate to maximise both bilateral and multilateral netting opportunities.

2.10 An important example of netting to reduce the cost and risk of settlement is the
593 'pair-off'. This is the action of netting instructions for payments of cash and transfers of securities for repos, reverse repos that are not managed by a tri-party agent and cash transactions, where those transactions are with the same counterparty, of the same currency, against the same security held at the same custodian or depository, by agreement with the counterparty to eliminate or reduce the cash payments and securities transfers required for settlement. Pair-offs can be between multiple instructions. Pair-offs are particularly helpful when rolling over a transaction, in which case, the parties would agree not to instruct securities settlement but instead pay or receive an agreed net cash payment.

Best practice recommendation. It is best practice for parties to co-operate to maximise both bilateral and multilateral netting opportunities. This includes the use of pair-offs to reduce settlement cost and risk.

2.10 Although netting to reduce settlement cost and risk is envisaged in the GMRA
694 (paragraphs 6(h) and 6(i)) where opposite payments in the same currency or transfers of the same security occur on the same date, in some circumstances, a party may not wish to net opposite payments or transfers, for example, because it needs to show flows into and out of separate accounts. In such exceptional circumstances, paragraph 6(h) and 6(i) may need to be made subject to express agreement between the parties by means of an amendment to the GMRA. Note that such an amendment applies only to the netting of payments and transfers: it does not remove the contractual right to net in the event of a default by the other party.

2.10 Note that paragraphs 6(h) and 6(i) do not preclude use of securities settlement
795 systems operating on a real-time gross settlement (RTGS) basis. While instructions sent to such securities settlement systems will be settled individually (gross) as they are accepted by the securities settlement system (in real time), the instructions from the parties or their agents can be the result of the netting of opposite payment and settlement obligations due on the same day.

3 Best practice in margining repo

Fixing an initial margin or Haircut

- 3.1 Initial margins and Haircuts are alternative ways to risk-adjust the value of collateral sold in a repurchase transaction in order to try to anticipate the loss of value that may be experienced if the collateral has to be liquidated following an event of default by the counterparty. Both amounts are therefore used to fix the expected liquidation value of collateral.
- 3.2 An initial margin can be defined as a percentage or a ratio. As a percentage, an initial margin is calculated as:

$$\left(\frac{\text{Market Value of collateral}}{\text{Purchase Price}} \right) \times 100$$

This means that a **percentage** initial margin is expressed relative to 100% and that an initial margin of 100% means there is no initial margin. An initial margin **ratio** is calculated as:

$$\left(\frac{\text{Market Value of collateral}}{\text{Purchase Price}} \right)$$

Worked example: applying an initial margin

A repo with a Purchase Price of EUR 20 million subject to an initial margin of 105% or 1.05 would require collateral of:

$$20,000,000 \times 1.05 = 21,000,000$$

Collateral worth EUR 20 million is repoed out subject to an initial margin of 105% or 1.05. The Purchase Price would be:

$$\frac{20,000,000}{1.05} = 19,047,619.05$$

In the GMRA, initial margin is called Margin Ratio (see paragraph 2(z) of GMRA 2000 and 2(bb) of GMRA 2011).

3.3 A Haircut is defined as:

$$\left(\frac{\text{Market Value of collateral} - \text{Purchase Price}}{\text{Market Value of collateral}} \right) \times 100$$

This means that a Haircut is expressed as the percentage difference between the Market Value of collateral and the Purchase Price of the repo.

Worked example: applying a Haircut

Collateral worth EUR 20 million is repoed out subject to a Haircut of 5%. The Purchase Price would be:

$$20,000,000 \times (1 - 0.05) = 19,000,000$$

A repo with a Purchase Price of EUR 20 million subject to a Haircut of 5% would require collateral of:

$$\frac{20,000,000}{(1 - 0.05)} = 21,052,631.58$$

- 3.4 Because an initial margin is expressed relative to the Purchase Price, while a Haircut is a percentage of the Market Value of collateral, the arithmetic of initial margins and Haircuts is slightly different. For example, an initial margin of 102% is not equivalent to a Haircut of 2%, but to one of 1.961% (ie 100/102%). The difference can become substantial for high initial margins and deep Haircuts.
- 3.5 In repos which are not being managed by a tri-party collateral management system initial margins and Haircuts are agreed at the point of trade, in which case, it is best practice to record the initial margin or Haircut in Confirmations and, where necessary, verify by affirmation. Initial margins and Haircuts can be agreed in advance of trading and recorded in Annex I of the GMRA.

Best practice recommendation. It is best practice to record the initial margin or Haircut in writing. If agreed at the point of trade, an initial margin and Haircut should be recorded in the Confirmation and, where necessary, verified by affirmation.

- 3.6 A party should be able to accommodate requests to apply initial margin to some repo transactions and Haircuts to other repos with the same counterparty.
- 3.7 Once agreed for a particular transaction, the initial margin or Haircut should be fixed for the full term of that transaction.

- 3.8 Note that it may be necessary, in the case of asset-backed securities (ABS), to apply a special type of haircut called a Pool Factor to reduce the dirty or gross price of the security in the event it has suffered a Pool Factor Distortion, that is, where the principal has been written down to reflect the insufficiency of underlying asset values or cashflows (see 10(f)(ii)(A) of GMRA 2011).

Calculation of Transaction Exposure for the purposes of Forward Transactions

- 3.9 In the GMRA 2011, the use of an initial margin or Margin Ratio is called Transaction Exposure Method A and the use of a haircut is called Transaction Exposure Method B.
- 3.10 In addition, in the GMRA 2011, the definition of Transaction Exposure itself has been amended so as to require the parties to choose either an initial margin or Margin Ratio (Transaction Exposure Method A) or a haircut (Transaction Exposure Method B). Unfortunately, the wording in the GMRA (in GMRA 2000 Annex I(2)(c) and in GMRA 2001 Annex I(2)d)) effectively removes the option to make this choice for forward repos. If parties wish to apply haircuts to forward repos, then this should be agreed as a supplementary condition in Annex I or in the Confirmation of the relevant transaction.

Calculating a margin call

- 3.11 A margin call should be made when one party has a Net Exposure to the other (see section 4(c) of GMRA 2000 and 2011). A Net Exposure arises when the aggregate exposure of one party to another exceeds the aggregate exposure of the second party to the first. The aggregate exposure of each party is equal to the sum of the exposures on each transaction still outstanding with the other party (each individual exposure is called a Transaction Exposure - see paragraph 2(ww) of GMRA 2000 and 2(xx) of GMRA 2011) plus any income due from the other party but unpaid (ie compensatory payments) plus Net Margin still held by one of the parties.
- 3.12 Transaction Exposure for the purpose of margining is calculated by marking each transaction to market. The mark-to-market calculation depends on whether the transaction is subject to an initial margin or to a Haircut.

Where collateral is subject to an initial margin:

$$\text{Transaction Exposure} = \left(\text{Repurchase Price} \times \frac{\text{initial margin}}{100} \right) - \text{Market Value of collateral}$$

Where collateral is subject to a Haircut:

$$\text{Transaction Exposure} = \text{Repurchase Price} - \left(\text{Market Value of collateral} \times \left(1 - \frac{\text{haircut}}{100} \right) \right)$$

- 3.13 It is market practice that the Market Value of collateral securities should include accrued interest up to but excluding the margin delivery date. This is different to the provision in the GMRA.

$$\text{Market Value of collateral} = \text{nominal value} \left(\frac{\text{clean price} + \frac{\text{coupon} \times \text{day count}}{\text{annual basis}}}{100} \right)$$

- 3.14 It is market practice that the Repurchase Price should be calculated for the day on which margin is due to be delivered (the margin delivery date), provided this is not later than the Repurchase Date. In other words, the day count for the repo rate should be the number of days up to but excluding the margin delivery date. This is different to the provision in the GMRA.

$$\text{Repurchase Price} = \text{Purchase Price} \left(1 + \frac{\text{repo rate} \times \text{day count}}{100 \times \text{annual basis}} \right)$$

- 3.15 The day count and annual basis for the calculation of Repurchase follows the convention in the wholesale money market in the currency of the Purchase Price (notably, the deposit and forward foreign exchange markets). This is almost always A/365F or A/360.
- 3.16 The day count and annual basis for the calculation of the accrued interest in the Market Value of collateral follows the bond market convention for the relevant currency and security (eg actual/actual for all eurozone and most other government fixed-income securities).

Worked example: applying an initial margin to calculate the required collateral value for a given Purchase Price

today	Thursday, 1 March 2012
Purchase Date	Monday, 5 March 2012
Repurchase Date	Monday, 12 March 2012
1-week repo rate	1.00% (A/360)
Purchase Price	EUR 25 million
Repurchase Price	25,004,861.10
collateral	2% DBR 4-Jan-2022 (A/A, note 2012 is a leap year)
clean price	101.79
days accrued	61
dirty price	102.12333333
initial margin	102%

$$\text{required Market Value of collateral} = 25,000,000 \times \frac{102}{100} = 25,500,000.00$$

Worked example: applying an initial margin to calculate the Purchase Price for a given Market Value of collateral

today	Thursday, 1 March 2012
Purchase Date	Monday, 5 March 2012
Repurchase Date	Monday, 12 March 2012
1-week repo rate	1.00% (A/360)
collateral	2% DBR 4-Jan-2022 (A/A, note 2012 is a leap year)
collateral amount	EUR 25 million nominal
clean price	101.79
days accrued	61
dirty price	102.123333333
Market Value of collateral	25,530,833.33
initial margin	102%

$$\text{Purchase Price} = \frac{25,530,833.33}{\frac{102}{100}} = 25,030,228.75$$

Repurchase Price	25,035,095.73
------------------	---------------

Worked example: applying a Haircut to calculate the Purchase Price for a given Market Value of collateral

today	Thursday, 1 March 2012
Purchase Date	Monday, 5 March 2012
Repurchase Date	Monday, 12 March 2012
1-week repo rate	1.00% (A/360)
collateral	2% DBR 4-Jan-2022 (A/A, note 2012 is a leap year)
collateral amount	EUR 25 million nominal
clean price	101.79
days accrued	61
dirty price	102.123333333
Market Value of collateral	25,530,833.33
Haircut	2%

$$\text{Purchase Price} = 25,530,833.33 \left(1 - \frac{2}{100} \right) = 25,020,216.66$$

Repurchase Price	25,025,081.69
------------------	---------------

Worked example: applying a Haircut to calculate the required collateral value for a given Purchase Price

today	Thursday, 1 March 2012
Purchase Date	Monday, 5 March 2012
Repurchase Date	Monday, 12 March 2012
1-week repo rate	1.00% (A/360)
Purchase Price	EUR 25 million
Repurchase Price	25,004,861.10
collateral	2% DBR 4-Jan-2022 (A/A, note 2012 is a leap year)
clean price	101.79
days accrued	61
dirty price	102.123333333
Haircut	2%

$$\text{required Market Value of collateral} = \frac{25,000,000}{\left(1 - \frac{2}{100}\right)} = 25,510,204.08$$

- 3.17 In the interval between a margin call being made by one party and margin being delivered by the other, the calculation of Net Exposure should assume that margin will be delivered.
- 3.18 It is currently market practice (but see paragraph 3.22 below) for the calculation of Net Exposure to include all transactions between two parties, except for overnight repos, for which:
- the Purchase date is today or earlier; and
 - the Repurchase Date is today or later.
- 3.19 Under Purchase Date valuation, the intention is that the inclusion of new or maturing transactions should be based on actual rather than assumed settlement. However, this practice requires parties to have the ability to confirm settlement before making or responding to a margin call.
- 3.20 For the purposes of Purchase Date valuation, where firms cannot confirm settlement before making or responding to a margin call, the most prudent approach is to assume settlement on the Purchase Date but not on the Repurchase Date. In other words, transactions should be automatically included in the calculation of Net Exposure on both their Purchase Date and Repurchase Date. This asymmetry of treatment is justified by the fact that settlement failures on the Repurchase Date are more common than on Purchase Dates and maturing transactions have larger Transaction Exposures than new transactions.

What transactions are included in the calculation of the Net Exposure of non-forward repos?

- 3.21 Where margin is paid or delivered for value on T+1 and T+2, the inclusion of repos in the calculation of Net Exposure up until their Repurchase Dates means that the contribution of each transaction to Net Exposure will be longer and will tend to increase margin. Any excess margin delivered as a result of this practice will be eliminated by the next margin call. It is sometimes argued that the inclusion of repos in the calculation of Net Exposure up until their Repurchase Dates means that some margin may be paid or delivered after the Repurchase Dates of the transactions generating the margin, which is not logical. However, the alternative is not to margin for collateral price movements over the last one or two Business Days of a transaction, which is likely to be a greater risk than extending the duration of margining. Parties need to decide where the balance of risk should lie. Paying or delivering margin for value on T+0 will significantly reduce the size of the problem.

Worked example: what transactions to include in the calculation of Net Exposure under Purchase Date valuation

Today is Thursday, 1 March 2012. You wish to calculate Net Exposure and, if necessary, make a margin call on counterparty ABC. Consider the following outstanding repo transactions with ABC:

<u>Transaction Date</u>	<u>Purchase Date</u>	<u>Repurchase Date</u>	<u>Type</u>	<u>Include?</u>
	1-Dec-11	1-Mar-12	3M	yes
	2-Feb-12	2-Mar-12	1M	yes
	9-Feb-12	9-Mar-12	1M	yes
	16-Feb-12	23-Feb-12 (failed)	1W	yes
	27-Feb-12	5-Mar-12	1W	yes
	23-Mar-12	25-Jun-12	forward	yes
27-Feb-12	28-Feb-12	6-Mar-12	1W	yes
29-Feb-12	1-Mar-12	2-Mar-12	ON	yes
1-Mar-12	2-Mar-12	5-Mar-12	TN	yes
1-Mar-12	5-Mar-12	5-Apr-12	1M	yes

- 3.22 Under the GMRA, a party with a Net Exposure has the right to (1) call for margin or (2) call for the early termination and replacement of a transaction (Repricing or Adjustment, commonly called ‘repricing’ in the European repo market --- see paragraph 3.55 below). However, under the terms of the standard agreement, this right can be exercised only on or after the Purchase Date. Such Purchase Date valuation is current market practice in Europe, except for repos cleared by CCPs, which calculate credit exposures from the transaction date. However, margining only from the Purchase Date allows credit exposure to build up. Exposures before the Purchase Date take the form of a replacement cost. If one party defaults before the Purchase Date, before the Purchase Price and collateral have been exchanged, given the assumption that defaulted transactions will be replaced, the other party may have an exposure to loss arising from adverse changes in the repo rate and in the Market Value of the collateral between the transaction date and Purchase Date. This replacement cost may become significant in the case of forward repos. Another consideration is that regulatory capital charges apply and the impact on regulatory leverage and liquidity ratios will be from the transaction date. Current practice could therefore be improved, particularly in the case of forward repos, to begin the process of calculating Net Exposure and, where necessary, calling for margin or repricing on the transaction date. To include replacement cost would require amendment of the terms of the GMRA. The adoption of valuation and margining/repricing from transaction date is likely to represent a major operational change for many firms and is therefore a medium-term objective for the European repo market.

Best practice recommendation. It is currently best practice in the European repo market, particularly in the case of forward repos, to begin the process of calculating Net Exposure and, where necessary, calling for margin or repricing on the transaction date, even though current market practice is and the GMRA provides for a start on the Purchase Date.

Hierarchy of tri-party contractual provisions

- 3.23 Where collateral management is delegated by the parties to a tri-party agent under a tri-party service agreement or set of related agreements, this typically results in certain provisions of the service agreement superseding certain provisions of the GMRA between the parties, in particular, in respect of variation margining, including the determination of the market value of collateral securities, the calculation of exposure and the operation of margining. Parties should ensure that such tri-party service agreements unambiguously reflect their intention to supersede certain provisions of the GMRA and clearly identify which provisions are being superseded and by what provisions of the tri-party service agreement in respect of repos for which collateral management is delegated by the parties to the tri-party agent.

Late transactions and net exposure/variative margin calculations

3.24 Where parties include repos in net exposure calculations from their transaction date or in the case of repos for same-day settlement (including overnight repos), there may be difficulties for some parties in including new transactions in the latest net exposure calculations if they are executed late in the day. This could lead to variation margin disputes where one party is able to include late transactions and the other is not. Therefore, when negotiating late transactions, parties need to be aware of the potential problem and make appropriate arrangements to avoid margin disputes. However, the party that is unable to include late transactions in its net exposure calculation needs to be aware of the risk to which it is exposed.

Margining failed purchases

3.25 The failure of the Seller to deliver collateral on the Purchase Date of a transaction does not automatically terminate the contract with the Buyer (nor is it an Event of Default under the GMRA, unless the parties had opted to include failure to deliver when they negotiated their agreement and the Buyer exercises his right under paragraph 10(g)(iii) of the GMRA 2000 or 19(h)(iii) of the GMRA 2011.

- Unless and until the Seller remedies the fail, he will have a short position in the collateral, that is, he is at risk of a fall in the clean price of collateral security and will accrue an income loss at the coupon rate. In addition:
 - If the repo rate on the transaction is positive, the Seller remains liable to pay interest at the agreed repo rate for every day of the fail.
 - If the repo rate on the transaction is negative, the Seller will earn the repo rate for every day of the fail, unless the parties have adopted either (1) the ICMA recommendation of November 2004 on failure to deliver in repos at negative rates (see paragraph 2.82~~69~~ above) or (2) if they have signed the GMRA 2011, the negative rate provision in Annex I, paragraph (2)(b). These provisions reset the repo rate to zero while there is a fail.
- The Buyer will have the opposite position.
- The above positions will create a Transaction Exposure for one of the parties. Paragraph 10(g)(ii) of the GMRA 2000 and 10(h)(ii) of the GMRA 2011 provide that the Seller shall pay cash margin to the Buyer for any Transaction Exposure that arises during the fail. But there is no obligation on the Buyer to pay margin to the Seller for any Transaction Exposure on the failed transaction.
- However, if the parties have agreed in Annex I, paragraph (I) of the GMRA, that failure to deliver shall be an Event of Default under paragraph 10(a)(ii), there will be no need for margining as any Transaction Exposure will be settled in the close-out.

Margining failed repurchases

- 3.26 If a transaction fails on its Repurchase Date, under Paragraph 10(h)(ii) of the GMRA 2000 and 10(i)(ii) of the GMRA 2011, the Buyer should pay cash margin to the Seller until the failure has been remedied by the Buyer or the transaction has been terminated by the Seller under paragraph 10(h)(iii) of the GMRA 2000 or paragraph 10(i)(iii) of the GMRA 2011 ('mini close-outs' --- see paragraphs 4.2-4.5 below). It is not recommended that the Seller should reciprocate.

What transactions are included in the calculation of the Net Exposure of forward repos?

- 3.27 As with non-forward repos, it is also current market practice (which is reflected in the GMRA - see Annex I, Part 2) not to include forward repos in the calculation of Net Exposure until they reach their forward Purchase Dates (and therefore cease to be forward transactions). The rationale has been that, until collateral and cash are exchanged on the forward Purchase Date, the only risk on the transaction which is posed by the possible default of one of the parties is that the non-defaulting party will have to arrange a replacement transaction at a worse Market Value of collateral and repo rate or buy-back price. In other words, until the forward Purchase Date, the risk on a forward repo is an interest rate risk and replacement cost, rather than the credit risk to which a counterparty is exposed from the Purchase Date (the risk of losing principal). Such interest rate risk could be hedged with interest rate risk management instruments rather than collateral.

- 3.28 Under the GMRA, shortly before the Purchase Date of a forward repo (when the interval to the Purchase Date is equal to the minimum period for the delivery of margin), any credit exposure can be addressed by calling margin or repricing or by the procedure set out in 2(b) of Annex I of GMRA 2000 and 2(c) of Annex I of the GMRA 2011, which allows parties, just prior to the Purchase Date, to adjust the Purchase Price or the number of Purchased Securities in order to eliminate any material difference between the Purchase Price and the required Market Value of the collateral in that particular transaction.

What price is used to value collateral?

- 3.29 Collateral securities must be valued at their dirty or gross prices (ie including accrued interest), rather than their clean or net prices. The number of days used in the calculation of accrued interest should be calculated from and including the last coupon payment date up to but excluding the date on which margin is due to be delivered (the margin delivery date). This is different to the provision in the GMRA.

- 3.30 To value each piece of collateral, best practice is to use the middle (clean) price quoted in the Appropriate Market for that security (see 2(c) of GMRA 2000 and 2(d) of GMRA 2011) at the close of business on the Business Day before the date of the calculation in the Appropriate Market, or, if that is not available, a price dealt at about the same time. In the event of exceptional intra-day collateral price movements, parties can agree to intra-day margin calls, which should use the latest available price. The use of the middle price assumes that the Buyer and Seller are equally likely to default. It also avoids generating higher margin calls or triggering repricing where the same security is repoed and reversed between two parties, one at the bid price and the other at the offer price. Some parties may seek to calculate the Market Value of collateral at the bid price (if they are the Buyer) or the offer price (if they are the Seller) on the grounds that this is the most prudent price for them. Such a choice would be appropriate when calculating the Default Market Value of collateral, as the non-defaulting party is entitled to protect itself in those circumstances by making conservative assumptions, but it would be unreasonable to the other party in the calculation of variation margins during the normal course of business. The Appropriate Market for a security is the financial centre which is the principal location for the trading of that security. A court judgement in the UK in 2016 rejected the concept of a 'global' or 24-hour market as a basis for pricing (Lehman Brothers International Europe v ExxonMobil Financial Services, October 2016).
- 3.31 It is best practice for parties to use executable prices when calculating the Market Value of collateral. Indices or other averages do not provide accurate prices for individual securities.

Best practice recommendation. It is best practice for parties to calculate the Market Value of collateral to use the middle clean price in the Appropriate Market for each security at close of business on the Business Day before the date of the calculation in the Appropriate Market. The prices used should be an executable price, if such prices are available. In the event of exceptional intra-day collateral price movements, parties can agree to intra-day margin calls, which should use the latest available price.

- 3.32 It is market practice, when calculating the Market Value of collateral fixed-income securities, to include accrued interest up to but excluding the margin delivery date. Note that this practice diverges from the terms of the GMRA.

- 3.33 The use of prices at the close on the Business Day before a margin calculation is intended to avoid parties trying to take advantage of intra-day price fluctuations to increase margin calls they are due to receive or decrease margin calls they are due to answer. Such behaviour would be likely to generate disagreement about valuations. Close of business is generally deemed to be a 'neutral' timing. However, it is possible that parties may disagree on the exact time of the close of business, even if they agree on the Appropriate Market, so best practice is for parties to agree on the timing of the close of business for the purposes of calculating the Market Value of securities.
- 3.34 Disagreement on the prices used in valuing collateral can be avoided if the sources are listed in Annex I of their GMRA. However, this is not always practicable. The most common current practice is for prices to be taken from the internal price database of the margin caller. This will record the prices at which deals have been executed and quotes received from the market by the caller.
- 3.35 In the event of a disagreement about a price which has been proposed by a margin caller, and if no price source has been specified in their GMRA, the parties should agree a price or a price source, negotiating reasonably and in good faith.
- 3.36 When calculating the Repurchase Price (Buy-Back Price) of a sell/buy-back, where the collateral is a fixed-income security and a coupon is paid during the term of the transaction, account has to be taken of the compensatory income payment owed by the Buyer to the Seller. In a sell/buy-back, this is deferred until the Repurchase Date. In the interim, the Buyer is presumed to reinvest the value of the coupon. The compensatory payment, including reinvestment interest, is then deducted from the Repurchase Price that the Seller would have had to pay in the absence of an income payment on the collateral. If the coupon payment date falls on a non-Business Day, the Repurchase Price should assume that the reinvestment of the coupon will start on the next Business Day (see paragraph 4.11 below). The formula for calculating the Repurchase Price of a sell/buy-back for use in repricing calculations where there is an income payment on the collateral is set out in the Buy/Sell-Back Annex of the GMRA (paragraph 2(a)(iii)(y)) (see paragraphs 2.~~84~~~~72~~-2.~~85~~~~73~~ above).
- 3.37 Because the dirty or gross price of a fixed-income security is used to calculate its Market Value, the payment of a coupon will reduce the Market Value of that security and may trigger a margin call. The same principle applies to equity collateral and payments of dividends. It is best practice to monitor forthcoming coupon or dividend payments to ensure smooth management of large margin calls on or by counterparties.

Best practice recommendation. It is best practice to monitor forthcoming coupon or dividend payments to ensure smooth management of large margin calls on or by counterparties.

How often should Net Exposure be calculated and margin called?

- 3.38 Net Exposure should be calculated at least every Business Day. In exceptional circumstances, it should be calculated intra-day.
- 3.39 Margin should be called whenever Net Exposure exceeds an agreed threshold (see the next sub-section).

Exposure thresholds and minimum transfer amounts

- 3.40 Parties to repos often agree a minimum Net Exposure below which they will not call a margin from each other. Once the Net Exposure equals or exceeds this threshold, a margin is called which is sufficient to eliminate the entire Net Exposure. For this reason, the threshold is often called a 'minimum transfer amount'. However, an exposure threshold and a minimum transfer amount can be different. The former may be used as a trigger for margining and the latter as the minimum amount of margin to be called once the threshold has been exceeded (eg see the US Treasury Market Practices Group's recommendations on 'Margining in Agency MBS Trading'). In this case, parties agree to tolerate unsecured Net Exposures up to the threshold and, once that threshold is breached, will not call margin until the excess over the threshold is greater than the minimum transfer amount. For example, if the agreed exposure threshold is 500,000 and the agreed minimum transfer amount is 100,000, a Net Exposure of 580,000 would not trigger a margin call. A Net Exposure of 620,000 would trigger a margin call of 120,000 to take the Net Exposure down to the threshold of 500,000. In the European repo market, exposure thresholds and minimum transfer amounts are generally assumed to be the same and, once the exposure threshold/minimum transfer amount is exceeded, margin is called to completely eliminate Net Exposure. It is best practice for parties to be clear about what is meant by exposure threshold and minimum transfer amount. It is also best practice, where an exposure threshold/minimum transfer amount has been agreed and a Net Exposure then exceeds that amount, to call margin sufficient to eliminate the entire Net Exposure.

Best practice recommendation. It is best practice for parties to be clear about what is meant by exposure threshold and minimum transfer amount. They should be the same but that needs to be made clear. It is also best practice, where an exposure threshold/minimum transfer amount has been agreed and a Net Exposure then exceeds that amount, to call margin sufficient to eliminate the entire Net Exposure.

- 3.41 A Net Exposure below the exposure threshold/minimum transfer amount is an unsecured credit exposure and should be subject to the credit limit for repo.

**Periodic
elimination of
Net Exposure
below an agreed
threshold**

- 3.42 The exposure threshold/minimum transfer amount should be agreed before trading starts. In practice, parties usually record mutually-agreed exposure thresholds/minimum transfer amounts in their GMRA.
- 3.43 Parties who agree exposure thresholds/minimum transfer amounts and record these terms in their GMRA can exercise greater control over their unsecured exposure to each other if they give each other the right to call for any Net Exposure below the agreed threshold to be eliminated regularly (eg at the end of each calendar quarter) or at any other time.

Best practice recommendation. It is best practice for parties who agree exposure thresholds/minimum transfer amounts with each other and record these terms in their GMRA to also agree that either party has the right to call for any Net Exposure below the threshold to be eliminated regularly (eg at the end of each calendar quarter) or at any other time.

- 3.44 A party may prefer not to agree an exposure threshold/minimum transfer amount with another party and thereby commit itself to potentially extending unsecured credit. Instead, it may decide on a confidential exposure threshold/minimum transfer amount (sometimes called a 'soft threshold') that it will observe internally, but will not make that amount known to the counterparty. This will allow it to reduce or eliminate the exposure threshold/minimum transfer amount in the event of concerns arising over the creditworthiness of the counterparty.

**Suspension of
an agreed
exposure
threshold and
minimum
transfer amount**

- 3.45 Where an exposure threshold/minimum transfer amount has been agreed, in the case of repurchase transactions, if one party accumulates a Net Exposure to the other while the second party is holding Net Margin, but the Net Exposure is less than the agreed exposure threshold/minimum transfer amount, the first party is typically unable to call back the Net Margin as he is not entitled to make a margin call. However, it is undesirable that any margin should be held other than against an exposure. It is therefore best practice in the circumstances described above for the party holding Net Margin to allow a margin call from the other party notwithstanding the exposure threshold/minimum transfer amount. Of course, the smaller the agreed exposure threshold/minimum transfer amount, the less material is the problem. Where an exposure threshold/minimum transfer amount is recorded in the GMRA, this exception should be an express part of the provision.

Best practice recommendation. Where the Net Exposure of one party on repurchase transactions is less than the agreed exposure threshold/minimum transfer amount, if any, and Net Margin is held by the other party, it is best practice for the other party to allow a Margin Call by the first party in order to eliminate the Net Margin.

What is the deadline for making a margin call?

- 3.46 Margin calls should be made early enough in the day to provide a reasonable amount of time to the other party, before payments or securities settlement systems close, in order that:
- the other party can receive and check the margin calculation and, where necessary, revert with a query;
 - the first party can respond to any query; and
 - the parties can try to resolve a disagreement by negotiation.

It would be usually reasonable to expect a margin call on a European counterparty to be made before 14:00 CET. Margin calls made after agreed deadlines should be treated as though they had been made on the next business day. Parties should explicitly agree margin call deadlines and record their agreement in their GMRA or, if that is not practicable, in their Confirmations.

Best practice recommendation. It is best practice to make margin calls early enough in the day to provide a reasonable amount of time before payments or securities settlement systems close for the other party to receive and check the margin calculation, for any query to be made and for an attempt at resolution by negotiation. It would usually be reasonable to make a margin call on a European counterparty before 14:00 CET. Parties should agree margin call deadlines and record their agreement in their GMRA or, if that is not practicable, in their Confirmations.

- 3.47 Where a party receiving a margin call intends to settle the call with a transfer that includes a European security, it would normally be reasonable for that party to notify the other party of its selection before 15:00 CET in order for the notification to be regarded as effective on the same business day, in other words, for the minimum margin delivery period to start on the same day as the notice has been given. In the case of North American securities, a reasonable deadline would normally be 16:00 CET. However, parties are free to agree other deadlines, for example, to take account of securities issued in other time zones or operational constraints. If there has been a disagreement about the size of a margin call, notification should be made immediately after resolving the dispute. If the party calling margin has a problem with the issue(s) offered by the margin-giver, it should promptly inform that party.

Best practice recommendation. Where a party receiving a margin call intends to provide a European security as margin, it would normally be reasonable to notify the other party before 15:00 CET. In the case of North American securities, a reasonable deadline would normally be 16:00 CET. If there has been a disagreement about the size of a margin call, notification should be made immediately after resolving the dispute. If the party calling margin has a problem with the issue(s) offered by the margin-giver, it should promptly inform that party.

- Which securities have to be accepted as margin?** 3.48 Securities offered as margin on repurchase transactions should generally be accepted if they are recognised as general collateral in the repo market or if they have characteristics the same as or better than the collateral originally purchased by the margin-taker (subject to risk management constraints such as collateral eligibility restrictions and portfolio concentration limits). If practicable acceptable margin securities should be listed in the GMRA. Otherwise, the margin-taker should act reasonably and in good faith when offered margin securities.
- Should initial margin or Haircut be deducted from margin securities?** 3.49 If an initial margin or Haircut has been taken from a particular issue of securities used as collateral in a repo with a particular counterparty, it is logical to apply an initial margin or Haircut to that same security if it is to be given as margin. In the GMRA 2011, provision is made for the parties to agree a Haircut (but not an initial margin) on margin securities. Such a Haircut is called Margin Percentage (see section 2(aa) of GMRA 2011). The initial margin or Haircut to be imposed on margin securities could be different from that imposed on the same securities when they were first repoed because of changing circumstances in the interval between the Purchase Date and the margin call.
- What is the deadline for delivering margin?** 3.50 Margin should be delivered within a deadline agreed between the parties. It is best practice to deliver cash margin on the same day as the call is made (T+0). It is also best practice to deliver margin securities on the same day as the call is made (T+0) but the most common practice currently is to deliver margin securities one or two days after the margin calls (T+1 and T+2).
- Best practice recommendation.** It is best practice to deliver cash margin on the same day as the margin call is made (T+0). It is also best practice to deliver margin securities on the same day as the margin call is made (T+0).
- Can margin securities be substituted?** 3.51 Securities that have been given as margin by one party can be substituted with the agreement of the other party, who should act reasonably and in good faith in response to such a request.
- Interest payments on cash margin** 3.52 Interest is due on cash margin, except where such margin is paid because of a failure by the Buyer to return certain collateral securities on the Repurchase Date (see paragraph 3.60 below on Cash Equivalent Amounts and paragraph 2.74 above on negative repo rates).
- 3.53 Interest should be accrued on cash margin at a reference rate plus or minus a spread agreed between the parties. Common reference rates are overnight indexes such as ~~SONIA~~ ~~€STR~~ for euro, SONIA or RONIA for the pound sterling and the Fed Funds Effective Rate for US dollars. Overnight indexes are considered appropriate because of the uncertain duration of margin.

3.54 Interest accruing on cash margin up to but excluding the day on which margin is due to be delivered (the margin delivery date) should be included in the calculation of Net Exposure. Accrued but unpaid interest on cash margin is included in the Net Margin used in the calculation of Net Exposure (see 2(ee) of the GMRA 2000 and 2(gg) of the GMRA 2011).

**How is
“repricing” used
to eliminate Net
Exposures?**

3.55 Under the GMRA, instead of eliminating Net Exposures by means of variation margin, alternative methods are offered. Each transaction is terminated and simultaneously a new transaction is created for the remaining term in which either (1) the Purchase Price of the new transaction is set equal to the new Market Value of the securities or (2) the nominal value of the securities is changed to bring the Market Value at the new market price into line with the original Purchase Price (see 4(j) and 4(k) of the GMRA 2000 and 4(k) and 4(l) of the GMRA 2011 respectively). In method (1), the Repurchase Price of the terminated transaction (as of the termination date) and the Purchase Price of the new transaction should be paid net. In method (2), the amount of the collateral securities of the terminated transaction and the amount of the collateral securities of the new transaction should, if they are the same (see below), be set off and delivered net. These methods are applied transaction by transaction, starting with the repo that has the largest Transaction Exposure (the difference between the Market Value of the collateral and the Repurchase Price --- how much cash is owed --- on the day of the calculation) until Net Exposure ceases to be material. These methods are sometimes collectively called ‘repricing’. In the GMRA, however, the first method is called Repricing and the second method is called Adjustment. Repricing and Adjustment were designed for documented sell/buy-backs but can be applied to repurchase transactions.

3.56 Under the Repricing method, accrued repo interest is ‘cleaned up’, ie paid over to the Buyer by not including it in the new Purchase Price.

3.57 Whereas margining is applied to transactions in aggregate, Repricing and Adjustment have to be applied to individual transactions. It is usual to reprice or adjust transactions in sequence, starting with the transaction with the highest Transaction Exposure, and continuing until Net Exposure is reduced to an acceptable level.

3.58 Under the GMRA, when a transaction is adjusted (ie Method 2), the parties can agree to allow the substitution of the collateral.

When is margin returned?

- 3.59 Cash margin and margin securities held by one party are not automatically returned to the other party under the GMRA when underlying transactions mature, unless the second party specifically requests the return of previous margin when making a subsequent margin call on the first party (see 4(d) of the GMRA). This means that margin can build up on both sides of a bilateral relationship. Only the difference or Net Margin affects the calculation of Net Exposure (see paragraph 3.11 above). Offsetting amounts of margin merely neutralise each other and so are wasted collateral. In order to avoid such a parallel build-up of margin by two parties, it is best practice for parties, when making margin calls, to recall margin previously paid or delivered to the other party.

Best practice recommendation. It is best practice for parties, when making margin calls, to recall margin previously paid or delivered to the other party.

- 3.60 If a party making a margin call requests the return of margin securities delivered to the other party in response to a previous margin call but the other party is unable to return those securities, despite its best endeavours and because of circumstances beyond its control, the GMRA 2011 allows the undelivered margin securities to be substituted, at least temporarily, by means of payment of a Cash Equivalent Amount (see 4(h) of GMRA 2011).

What happens if margin is not delivered?

- 3.61 Failure to deliver margin is not an automatic Event of Default under the GMRA 2000 or Automatic Early Termination event under the GMRA 2011. Under both versions of the GMRA, the non-defaulting party is required to serve a notice in order to trigger a default. If the non-defaulting party chooses not to serve a notice, the defaulting party should nevertheless endeavour to deliver the late margin at the earliest opportunity.
- 3.62 Delayed payments or deliveries of margin from one party should not be set off against margin calls made on the other party on subsequent days. To do so would encourage the unacceptable practice of trying to avoid a margin call by rolling that obligation forward to see if movements in market prices eliminate a Transaction Exposure.

What if a party disputes a margin call?

- 3.63** The GMRA does not include a dispute resolution procedure. However, the parties have a general legal obligation to act reasonably and in good faith. They also need to be aware of the potential regulatory consequences of disputed margin calls and recognise that, by engendering uncertainty about the size of exposures and the need for collateralisation, disputed margin calls weaken their own risk management. It will anyway be in their own interests to act reasonably and in good faith if they wish to preserve their professional reputation and the business relationship with their counterparty. Members of ICMA and the ERCC are expected to be conscious of their reputation in the market and of the need to preserve the integrity of the market by resolving disputes as promptly and efficiently as possible, and to do so by acting reasonably and in good faith as well as in a professional manner.
- 3.64** The parties to a disputed margin call also need to be aware that failure to meet a margin call is a potential Event of Default. On the other hand, the party making a margin call has a duty to act in good faith by promptly making available a copy of its calculations and should be able to substantiate these calculations.

Deadline for response to variation margin queries

- 3.65** Queries about margin calls and the response to such queries should be made urgently. Responses to margin queries should be made promptly before close of business in the time zone of the party originating the query. Parties should have in place clearly documented contingency procedures to try to efficiently resolve disagreements over margin calls, including an exchange of contacts in advance of trading of those responsible for margining at each party. The first stage in resolving a margin dispute is for both parties to check the portfolio of outstanding repos and the calculation of margins. Current market practice is for the party receiving and disputing a margin call to provide a copy of their portfolio of transactions. However, both parties should therefore be ready to promptly provide copies of both their portfolio and their margin calculations. It is also important that a party receiving a query about a margin call should give the assumptions underlying its calculations as well as other parameters and inputs. Margin disputes can be caused by differences in the internal rules being applied to margin calculations. For example, parties may be using different price sources to value securities; one party may include accrued interest in the Market Value of collateral only up to the margin calculation date, while the other may include accrued interest up to the margin delivery date (the latter is best practice but different from the GMRA --- see paragraph 3.29 above); or parties may differ in when they introduce new transactions into the margin calculation or when they drop maturing transactions (see paragraphs 3.18-3.22 above). If a material difference in margin calculations cannot be resolved by the teams responsible for margining, the dispute should be escalated within an agreed timeframe to senior business management and the credit risk management function.

- 3.66 It is best practice for a party disputing the size of a margin call to pay immediately the undisputed portion of the call while trying to resolve the dispute.

Best practice recommendation. It is best practice for parties to have in place clearly documented contingency procedures to try to efficiently resolve disagreements over margin calls and for a party disputing the size of a margin call to pay immediately the undisputed portion of the call while trying to resolve the dispute. It is also best practice for both parties to be ready to promptly provide the other with a copy of their portfolio of repos and their margin calculations plus the assumptions underlying the calculations as well as other parameters and inputs.

- 3.67 Margin disputes are often the result of the following divergent practices. When investigating disputes, it may be worth checking the following list.
- Parties are using different price sources to calculate the Market Value of the same securities.
 - Parties may differ in the use of bid, offer or middle prices. It is best practice to use the middle price (see paragraph 3.30 above)
 - Parties may differ in the time at which they take the price of a security. It is best practice to do so at close of business in the most Appropriate Market (see paragraph 3.30 above).
 - One party may be including accrued interest in the Market Value of securities up to the margin calculation date, while the other is including accrued interest up to the margin delivery date (which is recommended best practice).
 - There may be differences as to when new transactions are introduced into the calculation of Net Exposure (transaction date versus Purchase Date).
 - There may be differences as to when new transactions are removed from the calculation of Net Exposure (Repurchase Date or in advance by the margin delivery period).

Margin parameters to be agreed between parties before trading

- 3.68 In summary, in order to reduce the scope for misunderstandings and margin disputes, it is best practice to agree the following parameters for the calculation of variation margins before trading and to document the agreed parameters (possibly in Annex I of the GMRA):
- Price sources to be used to value collateral, either routinely or in the event of a margin dispute.
 - Whether the middle or bid rate will be used in the valuation of collateral.
 - When new transactions are to be included in the calculation of Net Exposure and when maturing or terminated transactions are to be dropped.
 - In the case of sell/buy-backs, the reference rate and any spread to be used to fix the interest rate at which compensatory (manufactured) payments will be reinvested until the Repurchase Date.
 - Exposure thresholds/minimum transfer amounts, if any.
 - Security issues or classes of security that will be acceptable in margin transfers.
 - Whether initial margin or Haircuts will be applied to margin securities.
 - Deadlines for delivering cash margin and margin securities.
 - The reference rate and any spread to be used to fix the interest rate on cash margin.
 - In the case of sell/buy-backs, whether the Repricing or Adjustment method will be used instead of margining.

Defining stale collateral prices

- 3.69 An extended holiday in the principal market for a security can make that security ineligible for use as collateral where one of the eligibility rules applied to the selection of collateral is that no security can be accepted as collateral if quotes become “stale”, which means that the latest available quote is older than an agreed number of Business Days (usually, two, three or five days). Such a rule is a particular problem for JGBs during the week-long Golden Week holiday in Japan.

Parties using tri-party collateral management services need to be aware of this problem and discuss with their counterparties whether anything needs to be done in response and, if so, what this should be.

In the case of parties transacting GC repos bilaterally (where collateral management is not delegated to a tri-party agent), unless otherwise agreed, it is best practice to define a stale price in terms of the number of Business Days in the principal market for a security (which will usually be the domestic market). This means, for example, that JGB prices quoted after Golden Week in Japan would not be considered stale, as the days during the holiday week would not be considered as Business Days for the purpose of determining staleness.

Best practice recommendation. It is best practice in bilateral GC repos for stale prices to be defined in terms of the number of Business Days in the principal market for a security.

4 Best practice in managing the life cycle of a repo

Failure to deliver

- 4.1 If one party becomes aware that it is likely to fail to deliver to the other, it is best practice to contact the other party as soon as possible to make them aware of the imminent failure. Where failure to deliver has been selected as an Event of Default under the GMRA between the parties, notice is a legal obligation (GMRA 2000 paragraph 10(l) and GMRA 2011 paragraph 10(m)).

Exercising a 'mini close-out' in response to a failure to deliver on the Repurchase Date

- 4.2 Where the Buyer in a repo fails to deliver collateral to the Seller on the Repurchase Date, the Seller has the right to exercise a 'mini close-out' on that transaction (under paragraph 10(h) of the GMRA 2000 or 10(i) of the GMRA 2011). Note that a mini close-out is different from the 'buy-in' procedure used in the cash market.⁶ Where a Seller decides to trigger a mini close-out (which is an exceptional step - see paragraph 4.5 below), in order to minimise the interval between the mini close-out and a buy-in on any linked cash transaction, it is best practice, for the Seller to serve, as soon as possible, a notice advising the Buyer that he intends to serve a mini close-out notice. This advisory notice should be served on the same day as the fail or as early as possible on the morning of the next Business Day or, if later, as soon as the Seller decides to trigger a mini close-out. The subsequent mini close-out notice should state that, if the Buyer has not delivered the same issue of securities to the Seller by noon of the same day, the Seller will serve a notice confirming execution of the mini close-out by close of business. Examples of an advisory notice and a mini close-out (execution) notice are provided in Annex IV (options A and B, respectively).
- 4.3 Under the GMRA 2011, the Seller is required to provide a statement to the Buyer showing, in reasonable detail, the calculation of the mini close-out amount. Under the GMRA 2000, the Seller is required to provide a Default Valuation Notice providing similar information. It may well be a contractual requirement under both GMRAs but it is certainly best practice that a statement under the GMRA 2011 and a Default Valuation Notice under the GMRA 2000 should include the prices and the sources of the prices used in the calculation of the Default Market Value of the collateral.
- 4.4 If a Seller triggers a mini close-out, it is best practice for the Seller to accept partial delivery of the security from the Buyer but without leaving an untradeable balance (see paragraph 2.70~~64~~ above).

Best practice recommendation. It is best practice to accept partial deliveries in a 'mini close-out' under paragraph 10(h) of the GMRA 2000 or 10(i) of the GMRA 2011 provided partial delivery will not leave an untradeable balance.

⁶ A mini close-out results in a net settlement of the difference between the Repurchase Price and the Default Market Value of the collateral. A buy-in seeks to arrange an alternative source of supply and provide compensation for any price difference.

- 4.5 Great caution should be exercised before triggering a mini close-out in the repo market for European securities. This is because the potential cost of a mini close-out in this market is considerably greater than the average return being made on the trading of repos. The risk of facing expensive mini close-outs would be likely to deter many parties from active participation in the repo market, which would seriously undermine market liquidity and raise the cost of transacting. Consider the potential cost of a mini close-out. Assuming that collateral is valued at the middle cash market price in the repo market, but at the offer price for a mini close-out, the cost of a buy-in would be equal to half the bid/offer spread in the cash market. Half the typical cash market bid-offer spread of 10 basis points (on a flat basis) on a EUR 100 million cash transaction in government bonds is worth EUR 50,000, whereas the typical repo market bid/offer spread of 5 basis points (per annum) for a 30-day repo of EUR 100 million of collateral would be worth only EUR 4,167. The mini close-out would also take into account movements in the value of collateral between the Repurchase Date and the date of the mini close-out calculation.

Best practice recommendation. It is best practice for the Seller in a repo on which the Buyer has failed to deliver collateral on the Repurchase Date, who wishes to trigger a mini close-out, to serve an advisory notice to the Buyer as soon as possible on the same day as the fail or as early as possible on the morning of the next Business Day or, if later as soon as the Seller decides to trigger a mini close-out. The subsequent mini close-out notice should state that, if the Buyer has not delivered equivalent securities to the Seller by noon of the same day, the Seller will serve by close of business a notice confirming execution of the mini close-out. It is best practice for the Seller to accept partial delivery of the equivalent security from the Buyer.

**Coupon,
dividend and
other payments
on collateral**

- 4.6 During the term of a repo, the collateral is the property of the Buyer, which means that all income generated by the collateral is paid by the issuer directly to the Buyer. However, because the value of the collateral within the Repurchase Price is fixed, both the risk and return on collateral in a repo should be retained by the Seller. So, under the terms of a repo contract, the Buyer is obliged to make compensatory income payments to the Seller (often called 'manufactured payments') whenever coupon, dividend or other income payments are paid on collateral. If the Buyer has sold the collateral to a third party, he is still obliged to make the manufactured payment. On the other hand, if the issuer of collateral fails to make an income payment, the Buyer does not have to make the manufactured payment to the Seller. And under the GMRA 2011 (paragraph 5(a)(ii)), if the Buyer fails to deliver collateral back to the Seller on the Repurchase Date, the Buyer is obliged to continue making manufactured payments to the Seller until the failure to deliver is rectified or the transaction is terminated. The guiding principle is that the Seller should receive the equivalent of all income payments due on collateral to the same extent that it would have received actual income had it not repoed out the collateral. These rules apply to income on Margin Securities, which will be received by the margin-caller, who should compensate the margin-giver.
- 4.7 Except in the case of tri-party repo, it has been the general practice in the market for a Seller to send a claim to a Buyer or for a margin-giver to send a claim to a holder of Margin Securities whenever a compensatory payment is due, as payments initiated without notice by the Buyer or holder of Margin Securities risk being rejected by the recipient. This practice is inefficient and can result in a backlog of unclaimed income which imposes additional administration on Buyers and holders of Margin Securities. In the case of bonds, the Seller or margin-giver should know when a coupon is due and anticipate the receipt of a manufactured payment. To facilitate the automation of manufactured payments, Sellers and margin-givers should maintain a schedule of coupons and coupon payment dates on securities that have been given as collateral in repos (including margin) and be ready to accept payments on those dates (although it should be noted that the obligation to make a manufactured payment remains with the Buyer or margin-holder). The Buyer or margin-holder should confirm the payment to the Seller or margin-giver on the payment date or notify the Seller or margin-giver of a default by the issuer of the securities.
- 4.8 It is also best practice for the Seller or margin-giver to allow the Buyer or margin-holder to pay manufactured payments into the main trade settlement account, in other words, the account used to pay and receive the Purchase Prices and Repurchase Prices of repo.

- 4.9 Best practice for manufactured payments also applies to scheduled partial redemptions of principal on amortizing bonds. Sellers and margin-givers should maintain a schedule of amortization payments and payment dates on securities that have been given as collateral in repos (including margin) and be ready to accept payments on those dates. The Buyer and margin-holder should confirm the payment to the Seller or margin-giver on the payment date or notify the Seller or margin-giver of a default by the issuer of the securities.

Best practice recommendation. It is best practice for Sellers and parties giving Margin Securities to maintain a schedule of coupons and other payments due on collateral and the payment dates and be ready to accept payments on those dates into the same account used to pay and receive the Purchase Prices and Repurchase Prices of repo. The paying parties should confirm the payment on the payment date or notify the receiving parties of a default by the issuer of the securities.

- 4.10 In a repurchase transaction, a compensatory income payment from the Buyer is due on the same day as the corresponding income payment by the issuer of the collateral (although current market practice is to wait until the receipt of the payment from the issuer has been confirmed the next day). But in a sell/buy-back, the compensatory payment is deferred until the Repurchase Date, which means that it has to be reinvested by the Buyer between the income payment date and Repurchase Date. The compensatory payment plus reinvestment income is deducted from the Sell Back Price or Repurchase Price. This can cause a problem in a sell/buy-back if the coupon is not paid by the issuer of the collateral. Unless the Buyer has sold the collateral to a third party, he will suffer the loss of the compensation plus reinvestment income, as this will have been deducted from the Repurchase Price he is due to receive, even though he will not have received the coupon. In effect, the deduction means the Seller will receive the compensatory payment (plus reinvestment income), notwithstanding the default by the issuer of the collateral and despite the intention that he should be the party exposed to the risk of default on the collateral. To prevent such an anomaly, the Repurchase Price of the sell/buy-back needs to be adjusted in such circumstances to reverse the deduction of the compensatory payment and reinvestment income. As there is no provision in the GMRA to do this, such a provision would have to be adopted by parties by means of an agreed amendment to their GMRA or, if that is not practicable, by inclusion in their Confirmations.
- 4.11 In the event that an income payment on collateral in a sell/buy-back is due to be paid on a weekend or other non-Business Day, the reinvestment period of the compensatory payment should start on the next Business Day (see paragraph 3.36 above).

Margining ex-dividend securities

- 4.12 When a coupon, a dividend or other income is paid on a security being used as collateral in a repo, the Market Value of that security should fall by the amount of that payment. The fall in Market Value will add to the gross exposure of the Buyer⁷ and may either increase the Buyer's Net Exposure or decrease the Seller's Net Exposure, which will affect the size and/or direction of variation margin calls. However, under paragraph 5 of the GMRA (both 2000 and 2011), the Buyer is obliged to make an immediate and equal payment (often called a 'manufactured payment') to the Seller on the income payment date of the collateral security. This payment should immediately offset the effect of the fall in Market Value on Net Exposure and on variation margin.

The effect of negative accrued interest on collateral value

- 4.13 Negative accrued interest is a term used to describe the effect on the market value of a fixed-income security of having an income record date that precedes the income payment date, that is, the effect of a so-called "ex-dividend period" between the record of who is to receive a payment and the payment itself. If a fixed-income security is being used as collateral in a repo, the advent of an ex-dividend period, other things being equal, will reduce the market value of the collateral and increase the transaction exposure of the buyer, which may trigger a variation margin call. Negative accrued interest can be a confusing topic and an explanation of the concept is provided in Annex VI for information.
- 4.14 However, a problem can arise in the case of securities which pay coupons, dividends or other income to whoever is recorded by the relevant central securities depository (CSD) as holding the security on an 'income record date' which precedes the income payment date. In this case, the Market Value of the security should fall immediately but no income will be due to the Buyer and consequently no manufactured payment will be due to the Seller until the income payment date. During the 'ex-dividend period' between the income record date and income payment date, the Seller will have an unsecured exposure to the Buyer for the amount of the future income payment.⁸ Some variation margining systems do not take account of the fact that the Buyer is due to receive income in the future. The result is that Sellers are receiving variation margin calls on the income record date with no account being taken of their exposure in respect of the manufactured payment. By contesting such calls, Sellers increase the rate of margin disputes observed by regulators and raise the possibility of regulatory sanction. The problem is increasing as more securities, particularly emerging market bonds, adopt longer ex-dividend periods.

⁷ The same issues apply to the holder of Margin Securities on which income is paid.

⁸ The term 'ex-dividend' is used for both equities and fixed-income securities, even though most income payments on the latter are called coupons.

- 4.15 The problem of ex-dividend periods will be worse where a security has been repoed out over the income record date but the income payment date occurs after the Repurchase Date. In this case, coupons, dividends or other income will be paid to whoever was the Buyer during the repo, while no manufactured payment will be due to the Seller, given that the repo will have terminated by the income payment date. If, as a result of the fall in the Market Value of the collateral security during the life of the repo, there is an increase in a variation margin called by the Buyer or a decrease in the variation margin called by the Seller, the Seller would suffer an unintended loss of income which will not be recovered until Net Exposure is recalculated after the income payment date.
- 4.16 Under paragraph 4(c) of the GMRA (2000 and 2011), until a manufactured payment has been paid to the Seller, it is an 'amount payable to the first party under paragraph 5 but unpaid' and, as such, should be included in Net Exposure and variation margins. In the GMRA 2000 paragraph 2(x) and GMRA 2011 paragraph 2(z), the income payment date is defined as 'the date on which Income is paid in respect of such Securities or, in the case of registered Securities, the date by reference to which particular holders are identified as being entitled to payment of Income'. For registered securities, it seems clear that future income payments add to the Net Exposure of the Buyer or subtract from the Net Exposure of the Seller as soon as the Securities go ex-dividend on an income record date. As this is coincident with the fall in the Market Value of the Securities, it immediately offsets the impact of the fall in the Market Value on Net Exposure and variation margin. What about unregistered securities? The GMRA implicitly assumes that income record dates and ex-dividend periods are characteristics of registered securities only. Historically, that was indeed the case but market practice appears to have changed. However, the GMRA may be able to cope with this change. Given that the agreement is intended, in the normal course of business, to protect both parties to a repo, it could be implied that the reference in paragraph 4(c) to the inclusion in Net Exposure of a manufactured payment that is 'payable...but unpaid' is intended to be read as income to which the Seller is entitled on the income record date, even though it is not due for payment until the income payment date. This would mean that income paid on a non-registered security also adds to the Net Exposure of the Buyer or subtracts from the Net Exposure of the Seller as soon as it goes ex-dividend on an income record date, coincident with the fall in the Market Value of the Securities, and therefore immediately offsetting the impact of the fall in the Market Value on Net Exposure and variation margin.

- 4.17 In order that the GMRA operates as intended, it is best practice for parties to include future manufactured payments in Net Exposure from the earlier of the income record date and the income payment date until actual payment. In order to avoid the variation margin disputes that can be caused by ex-dividend periods, parties should consider amending GMRA 2000 paragraph 2(x) or GMRA 2011 paragraph 2(z) to read “Income Payment Date”, with respect to any Securities, the date on which Income is paid in respect of such Securities or, in the case of a payment of Income the entitlement to which is determined by reference to the holding of the relevant Securities on a particular date, such date.’ or, if amending the GMRA is not practicable, the amendment could be inserted in Confirmations.

Best practice recommendation.

- It is best practice for parties to include future manufactured payments in Net Exposure from the earlier of the income record date and the income payment date until actual payment. This means that Net Exposure should not change due to a collateral security going ex-dividend.
- In order to avoid the variation margin disputes that can be caused by ex-dividend periods, parties should consider amending GMRA 2000 paragraph 2(x) or GMRA 2011 paragraph 2(z) to make clear that manufactured payments are to be included in Net Exposure from the income record date or, if amending the GMRA is not practicable, the amendment could be inserted in Confirmations.

Dealing with the resetting of a coupon on floating-rate collateral in a sell/buy-back

- 4.18 Where a floating-rate security, such as an FRN, is used as collateral in a sell/buy-back, it is possible that the coupon on the security will reset during the term of the transaction. This creates a problem, as the Repurchase Price (Sell Back Price) will have been fixed at the start of the transaction using an assumed future coupon. For example, it may have been assumed, for the sake of simplicity, that the next coupon will be the same as the current coupon. However, the new coupon is very likely to turn out to be different from the current coupon. The question then arises, should the difference between the new and assumed coupons be managed by making (1) a retrospective change to the Repurchase Price (Sell Back Price) or (2) a subsequent interest claim? Market practice tends towards the former method. However, this contradicts the terms of the GMRA Buy/Sell-Back Annex, which does not envisage a retrospective change to the Repurchase Price (Sell Back Price), which means that such a change would not be enforceable under the standard annex. It is recommended that, when using a floating-rate security as collateral in a sell/buy-back, the parties should consider including a supplementary term in Annex I of the GMRA or, if that is not practicable, in Confirmations, to the effect that the Repurchase Price (Sell Back Price) will be changed to reflect the resetting of the coupon.

Best practice recommendation. If the coupon on a floating-rate security being used as collateral in a sell/buy-back is reset during the term of the transaction, it is best practice to anticipate this event by including a supplementary term in Annex I of the GMRA or, if that is not practicable, in Confirmations, to the effect that the Repurchase Price (Sell Back Price) will be changed to reflect the resetting of the coupon.

Exercising permissions to substitute collateral

- 4.19 Ideally, substitution should be performed by means of a simultaneous delivery-versus-delivery (DVD) exchange of the original collateral and substitute collateral; or by simultaneous back-to-back (delivery-versus-payment) DVP deliveries.⁹ However, DVD and simultaneous back-to-back DVP deliveries are often not possible or practicable, in which case, it is market practice for the Seller to deliver the substitute before the Buyer releases the existing collateral. This of course exposes the Seller to credit risk on the Buyer.
- 4.20 Although the Seller may have permission to substitute, the Buyer is not obliged to accept any substitute offered by the Seller. To insist otherwise might jeopardise the validity of the outright transfer of legal title to the collateral from the Seller to the Buyer.
- 4.21 The substitute should be at least of the same value and at least of the same quality in terms of credit and liquidity. If the substitute is too different from the original security, there could be an objection to accounting for the transaction as a repo. This is because a repo with permission to substitute collateral is accounted for as a financing transaction, and therefore continuing to recognise the collateral on the balance sheet of the Seller depends on the substitute being “similar and of equal fair value” to the collateral being substituted.¹⁰
- 4.22 If a disagreement arises over the acceptability of a particular proffered substitute security, the parties should negotiate reasonably and in good faith. Disputes can be avoided if security issues or classes of security that would be acceptable or which would not be acceptable to the Buyer as substitutes are agreed in advance in writing (see paragraph 2.29 above).
- 4.23 Permission to substitute collateral can be sought not only by the Seller from the Buyer, but parties can agree permissions on margin securities held by either.

⁹ Even if back-to-back DVP deliveries are not exactly simultaneous, each is collateralised by cash in its own right.

¹⁰ The guidance AG51(c), which was provided for IAS 39, stated, ‘Repurchase agreements and securities lending—right of substitution. If a repurchase agreement at a fixed repurchase price or a price equal to the sale price plus a lender’s return, or a similar securities lending transaction, provides the transferee with a right to substitute assets that are similar and of equal fair value to the transferred asset at the repurchase date, the asset sold or lent under a repurchase or securities lending transaction is not derecognised because the transferor retains substantially all the risks and rewards of ownership.’ IAS 39 has been replaced by IFRS 9 but guidance has not yet been issued.

The issuance of termination notices to counterparties

- 4.24 Before serving termination notices, including mini close-out notices but not Default Notices, it is best practice, if time allows, to give advance notice to a counterparty, including its repo desk, of your intention to serve a notice. Such courtesy is a matter of good relationship management but it may have the benefit of prompting the counterparty to take urgent action to remedy the underlying problem. Parties should therefore ensure that the department responsible for issuing such notices forewarns their own repo desk of planned termination notices. This may require formal procedures to be put in place, particularly where such operations have been delegated to geographically distant locations. However, a policy of forewarning one's own repo desk does not mean that the desk should be allowed to delay or prevent the issuance of a termination notice.

Best practice recommendation. It is best practice, if time allows, before serving termination notices, other than Default Notices, to give advance notice to a counterparty, including one's own repo desk, of the intention to serve a notice. However, repo desks should not be allowed to delay or prevent the issuance of such notices.

- 4.25 It is best practice to prepare for termination events, including Events of Default and failures to deliver collateral, by drafting templates of termination notices in advance of possible future need. A model form of the notice that should be served on a Buyer to trigger a mini close-out, which has been prepared by the ICMA, is attached at Appendix III.

Best practice recommendation. It is best practice to prepare for termination events, including Events of Default and failures to deliver collateral, by drafting templates of termination notices in advance of possible future need.

Confirmation and affirmation of post-trade amendments and updates to the agreed terms of a repo and the exercise of options

- 4.26 When the agreed terms of a repo are amended or updated after its Purchase Date (eg a floating-rate index is refixed) or an option is exercised (eg the termination of an open repo), it is best practice to promptly confirm or affirm the change. Confirmation and affirmation will constitute prima facie evidence of the amendment, update or exercise of an option in the event of a dispute.¹¹ Confirmation and affirmation are particularly important in structured transactions, such as term repos, evergreen and extendible repos and floating-rate repos. Confirmation and affirmation are also particularly important for large (over EUR 50 million or equivalent) or longer-term repos (with an initial term of one year or more), as the consequences of a mistake or disagreement about contractual terms would be greater.
- 4.27 It is best practice to cross-reference Confirmations of post-trade updates to a repo to the Confirmation of the original transaction in order to allow the contractual terms which are being updated to be checked.

Best practice recommendation. It is best practice to promptly confirm or affirm post-trade amendments or updates to the agreed contractual terms of a repo. Updates should be cross-referenced to the original Confirmation.

Addresses

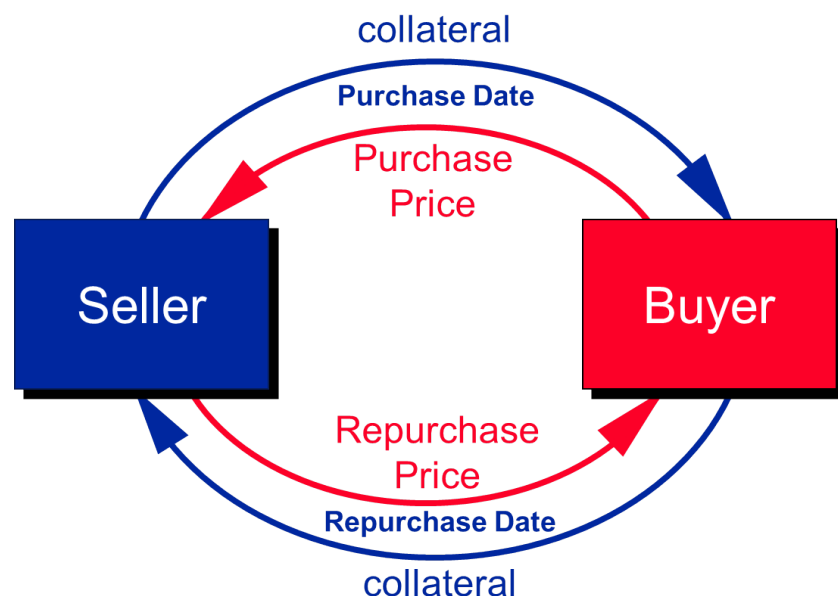
- 4.28 Parties should ensure that they notify their counterparties in good time of changes in the address to which notices should be sent under the terms of their GMRA. They should also prompt counterparties to do the same. Parties should consider adding the words “and subsequent addresses” to paragraph 14(a)(iii) of the GMRA 2011 by recording the amendment in Annex I.
- 4.29 If parties wish to serve notices under the GMRA 2000 by e-mail, they should amend their agreement accordingly, as use of e-mail was not envisaged when the agreement was drafted. The amendment should be recorded in Annex I of the GMRA or, if that is not practicable, in Confirmations.

¹¹ ‘Amendments’ mean mutually-agreed changes to the original contractual terms of the transaction, such as changes in initial margin or Haircut. ‘Updates’ mean changes to prices and other contract details envisaged in the original contract, such as the refixing of the rates on floating-rate repos and the allocation and pricing of collateral on forward repos. ‘Exercising an option’ includes decisions to change the contractual terms which one of the parties is entitled but not obliged to make, such as calling margin, substituting collateral and repricing or terminating open repos.

Annex I - Understanding repo and the repo market

The legal structure and economic character of repo

1. Repo is a generic term for *repurchase transactions* and *buy/sell-backs*. Repos (along with securities lending) are a type of *securities financing transaction (SFT)*.
2. In a repo, at the start of the transaction (the *Purchase Date*), one party (the *Seller*) sells assets, typically securities, to another party (the *Buyer*) at one price (the *Purchase Price*) and commits to repurchase the same quantity of assets which are *equivalent* to those sold (see paragraph 12.3 below) at a future date or on demand (the *Repurchase Date*) at a different price (the *Repurchase Price*). It is market terminology to refer to the assets in a repo as *collateral*, as they can be sold off by the Buyer in order to recover his cash, should the Seller default on his obligation to pay the Repurchase Price on the Repurchase Date (or default on another contractual obligation owed to the Buyer).¹²



3. Although the Seller sells collateral to the Buyer at the start of a repo, his obligation to buy back equivalent collateral in the future means that the Buyer has only temporary possession of the collateral and the Seller has only temporary use of the cash. Therefore, despite a repo being structured legally as a sale and repurchase of collateral, it behaves economically like a secured loan or deposit (ie a loan or deposit against a security interest in assets). The Buyer is effectively making a secured loan to the Seller. The Seller is effectively taking a secured deposit from the Buyer.

¹² Legally-speaking, because they have been sold, the assets in a repo are not 'collateral' (which is the traditional term for assets in which a security *interest* has been vested by a borrower to a lender in order to secure a loan).

4. It is market terminology to describe the Buyer as transacting a *reverse repo*. The Seller is simply said to be transacting a repo.
5. The basic uses of repo are (1) the borrowing and lending of cash on a secured basis and (2) the borrowing and lending of securities (in effect, against cash collateral).
6. The difference between the Purchase Price paid by the Buyer on the Purchase Date and the Repurchase Price received by the Buyer on the Repurchase Date is the return to the Buyer on the cash he is effectively lending to the Seller. This return has nothing to do with any coupons, dividends or other income payments that may be paid on collateral during the term of a repo, which are made separately from the payments of the Purchase Price and Repurchase Price (see paragraph 12.7 below).
7. In a repurchase transaction, the difference between the Purchase Price and the Repurchase Price is quoted as a percentage per annum rate of return. In market terminology, this is called a *repo rate*. The return is called *repo interest*.¹³ This means that the Repurchase Price of a repo is equal to the Purchase Price plus repo interest.
8. The price of a buy/sell-back has traditionally been quoted as the *forward price* of the security being used as collateral. However, buy/sell-backs are now often quoted in terms of their implicit repo rates. The differences between repurchase transactions and buy/sell-backs are explained in paragraphs 24-27.
9. A fundamental characteristic of a loan or deposit is that the principal sum of money lent by one party to the other on the value date is the same sum that will be repaid at maturity. In a repo, the principal sum effectively being lent by the Buyer to the Seller is the Purchase Price. As the Repurchase Price is equal to the Purchase Price plus repo interest, the principal sum effectively to be repaid in a repo is indeed the same as the principal sum that was lent, confirming that a repo behaves like a secured loan or deposit in all economic respects.
10. The fact that the principal sum effectively being lent in a repo is the same as the principal sum that will effectively be repaid gives rise to a practical problem. The Purchase Price is set by reference to the market value of the collateral at the start of the repo (it will typically be equal to or less than the market value of the collateral - see paragraph 14 below). While the principal sum in a repo does not change, the market value of the collateral does. If the market value falls below the Repurchase Price, the Buyer would not be able to recover his cash by selling off the collateral, should the Seller default. Equally, if the market value of the collateral rises above the Repurchase Price, the Seller would not have enough cash to be able to buy back all his assets, should the Buyer default. These

¹³ Legally-speaking, this is not correct, as the legal form of a repo is not an interest-paying loan or deposit; the return is just the difference between two prices.

unsecured credit exposures have to be eliminated by means of additional payments of cash or transfers of collateral, or an equivalent mechanism, in the process called *margin maintenance* (see paragraph 14 below).

The importance of transfer of title to collateral

11. It has been explained that repo behaves economically like a secured loan or deposit but is structured legally as a sale and repurchase of securities. There are two reasons for adopting this legal structure.
 - 11.1 First, a sale of collateral means that there has been an outright transfer of legal title to the collateral to the Buyer. In other words, the collateral becomes the unencumbered property of the Buyer, giving him the unfettered right to sell off the collateral should the Seller default (in fact, he can sell at any time during the term of the repo). Transfer of title contrasts with the traditional method of collateralisation, which is by attaching a security interest to the collateral (eg a *pledge*). Security interests give the secured lender only limited rights to the collateral. Typically, he can only sell the collateral upon the default of the other party.¹⁴ However, even then, he can only sell if he succeeds in converting his contingent claim on the collateral into outright legal title. The problem is that, because the defaulting party retains property rights in the collateral, the non-defaulting party may have to participate in the liquidation or restructuring of the defaulting party in order to secure his collateral and will probably have to contest his claim against the liquidator or similar insolvency official and other creditors. This usually takes a long time. In addition, the non-defaulting party will typically have had to complete various formalities to create a valid security interest: any mistakes could jeopardize his claim on the collateral. In contrast, in repo, the absolute control over collateral given to the Buyer by the transfer of legal title eliminates the delay in being able to dispose of collateral and minimises the legal risks arising in a default by the Seller. There is therefore less credit risk in a repo.
 - 11.2 Second, an outright transfer of legal title to collateral means that the Buyer has the automatic right to re-use the collateral during the term of the repo, whether or not the Seller defaults. This means he can repo or sell the collateral to a third party at any time (the Buyer only has to make sure he is able to obtain equivalent collateral to return to the Seller by the Repurchase Date). This right of re-use reduces the liquidity risk to which the Buyer is exposed by virtue of having lent his cash, because it means he can liquidate the collateral whenever he needs cash (assuming the collateral is reasonably liquid).
 - 11.3 The reduced credit and liquidity risk to the Buyer means that repo should be a cheaper and more plentiful source of funding than secured loans and deposits.

¹⁴ In the case of a security interest in the form of a pledge, the pledgee cannot sell collateral unless there has been a default by the pledgor or, other than in a default, only if the pledgor has given the pledgee a right of *re-hypothecation*, in which case, the pledgee can convert the pledge/security interest into a contractual claim to return equivalent assets. Rights of re-hypothecation tend to be limited to relationships between prime brokers and hedge funds.

12. The outright transfer of legal title to collateral in a repo has a number of important consequences for the way that repo functions:

Payments of coupons and dividends

- 12.1 If, during the term of a repo, a coupon, dividend or some other income is paid by the issuer of the collateral, that payment must be made directly to the Buyer, given that he is the legal owner of the collateral during the term of the repo. However, the Buyer is contractually obliged to make an immediate and equal payment to the Seller. See paragraph 12.7 below.

Voting rights and corporate actions

- 12.2 The voting rights attached to equity being used as collateral belong exclusively to the Buyer, as he is the legal owner of the collateral during the term of the repo. However, under the Equities Annex to the GMRA, the right to take decisions on corporate actions in the case of equity being used as collateral is the Seller's, provided he gives the Buyer requisite notice of his decision.

What is 'equivalent' collateral?

- 12.3 As explained already, the Buyer is only obliged to sell back equivalent collateral securities to the Seller at the end of a repo. 'Equivalent' means collateral securities that are economically but not legally identical to that purchased at the start. In other words, the collateral securities to be repurchased are fungible with the collateral securities sold at the start. In practice, this means the equivalent collateral securities are a different part of the same issue (eg usually the same ISIN). The Buyer needs this flexibility in order to be able to exercise his right to re-use the collateral securities during the term of a repo by repoing or selling the securities to a third party. If the Buyer sells the securities to a third party, he is unlikely to be able to recover the same holding of securities (ie legally identical) in order to be able to return to the Seller on the Repurchase Date but he should be able to buy back the same type of securities (ie economically identical). Consider the following example. Assume party A buys 10 million of a certificated bond issue (say, certificate 123) through a repo from party B and sells those bonds outright to party C. At the end of the repo, party A will have to buy 10 million of the same bond issue outright in order to sell back to party B to close out the repo. Whether party A can buy back from party C or has to buy back from a fourth party, party A is highly unlikely to receive exactly the same certificates. However, he should be able to buy back other certificates of the same issue (eg certificate 129). In other words, he should be able to buy back economically but not legally-identical collateral. And as Party B should be indifferent between different certificates of the same bond issue, there should be no problem in limiting the obligation of the Buyer to returning such equivalent collateral. If Party A had to return certificate 123, it would deter him from re-using the bond. This might be seen by a court as an indication that Party A was not, in fact, the legal owner but a lender with only a security interest in the bond. In that case, if Party B defaulted, Party A would be sucked into the long, uncertain and contested insolvency process.

- 12.4 Limiting the obligation of the Buyer to the return of equivalent collateral has practical, rather than just legal, benefits. For example, if party A repos out

shares in company ABC to party B and company ABC is then purchased by company XYZ during the term of the repo, what does party B sell back to party A? The answer is equivalent assets, in this case, whatever XYZ paid for ABC.

The Seller retains the risk exposure and return on collateral

12.5 Because the Seller commits to buy back equivalent collateral on the Repurchase Date at a fixed or calculable Repurchase Price, he is exposed to changes in the market price of the collateral during the term of the repo, even though the Buyer is the legal owner. For example, if a Seller repos out a quantity of bonds at a Purchase Price equal to their current market value of 101.50 and commits to repurchase them in one week at a Repurchase Price of 101.55 (= 101.50 plus repo interest of 0.05), he is exposed to the risk that the market price of those bonds may be less than 101.50 at the end of the week, in which case, he will only be able to on-sell them into the market at a loss. Given that the market price of the bond will be driven largely by the perceived creditworthiness of the issuer, and fluctuations in relative supply and demand in response to economic and financial news, the Seller remains exposed to the credit, liquidity and market risks on the bond, despite having sold it as collateral in a repo.

12.6 The fact that the Seller retains the risk exposure on collateral is essential to the functioning of repo as a financing instrument. All that a Seller wants a repo to do is to provide cash to fund the purchase of an asset and allow him to take a long position in it. The purpose of the long position is to take the risk on the asset, so it would be pointless if that risk was transferred through the repo. The Buyer, on the other hand, only wishes to make a secure short-term investment of surplus cash, not make an unsecured investment in the asset being offered as collateral (if he wished to invest in the asset, he would buy it for himself). The only purpose of the collateral for the Buyer is to mitigate the credit and liquidity risks of lending cash to the Seller. Consequently, a key principle in the operation of repo is that only the Seller should be exposed to the risks on the collateral.

The consequences of coupon, dividend and other income payments on collateral

12.7 If the Seller in a repo is to take the risk on the collateral, he will expect to receive the corresponding return. The return on collateral is paid in various forms.

- The capital gain (loss) from a rise (fall) in the clean price of a fixed-income security or the price of an equity security being used as collateral will automatically accrue to the Seller, given that he has committed to repurchase the security at a fixed or calculable Repurchase Price.
- The coupon interest that accrues on a fixed-income security during the term that it is being used as collateral will also automatically accrue to the Seller. On the Purchase Date, the Seller receives the Purchase Price, which (assuming no initial margin or haircut - see paragraph 13) is equal to the clean price of the bond plus the accrued interest outstanding on that date. On the Repurchase Date, the Seller pays back the Repurchase Price, which is equal to the Purchase Price plus repo interest, but gets back a bond with the extra coupon interest that has accrued during the term of the

repo. For example, if a bond with 100 days accrued interest is repoed out for 7 days, the Seller will pay a Repurchase Price that will include only the original 100 days of accrued interest but will get back a bond with 107 days of accrued interest.

- If a coupon is paid on a fixed-income security or a dividend is paid on an equity security while it is being used as collateral, the issuer is obliged to pay the coupon or dividend to the Buyer, as he is the legal owner of the security. But the repo contract obliges the Buyer to pay an immediate and equal sum of money to the Seller. In the UK, this contractual compensatory payment is often called a *manufactured payment*. In a repurchase transaction, the manufactured payment is due on the same day as the coupon or dividend payment by the issuer. In a buy/sell-back, the manufactured payment is deferred until the Repurchase Date (which means it has to be supplemented by reinvestment interest to compensate the Seller for the delay between the income payment date and the Repurchase Date).

Initial margins, haircuts and margin maintenance

13. If collateral is not very liquid, the Buyer will be exposed to the risk that, if he should have to liquidate that collateral following a default by the Seller, the time it takes to complete the liquidation (on top of the delays in discovering and deciding how to respond to the default) may result in unexpected losses. In order to protect himself against this risk, the Buyer can seek an initial margin or haircut on the collateral, ie setting the Purchase Price below the market value of the collateral.
14. In addition, as explained in paragraph 10 above, the Buyer and Seller are exposed to the risks that the market value of collateral may, respectively, fall below or rise above the Repurchase Price, opening up a credit exposure for one of the parties. Any such credit exposures are eliminated by the prompt transfer of variation margins to the exposed party by the other party, in the form of either a cash payment or a transfer of collateral. However, the GMRA offers an alternative procedure that was originally designed for documented buy/sell-backs but is not widely used.

Permission to substitute collateral

15. A Seller is not entitled to receive equivalent collateral until the Repurchase Date. However, many Sellers are active traders of securities, which means that, unless they restrict their repos to open transactions or very short terms, they take the risk of not being able to trade a security when they wish because it might be out on repo. The Seller can overcome this risk by obtaining from the Buyer permission to substitute collateral (one or more times) at any time during the repo, with an alternative asset that is acceptable as collateral to the Buyer.
16. Permissions to substitute are useful to the Seller but may be inconvenient to the Buyer, who may feel constrained in re-using the collateral because of concern that the Seller might exercise his permission and it might prove difficult to buy

the collateral back from the market in time to substitute. In order to compensate the Buyer for this risk and for the operational cost of substitution, repos with one or more permissions should pay a higher repo rate than on otherwise equivalent repos.

17. In practice, permission to substitute is rare in the European market outside of tri-party repo (see paragraph 33 below) or structured repos.

What happens in a default?

18. Under the ICMA Global Master Repurchase Agreement (GMRA) 2000, when an event of default occurs, the non-defaulting party has to serve a Default Notice on the defaulting party, unless the event of default is one of two particular acts of insolvency, in which case, the other party is automatically in default. Once any necessary notice has been served on the defaulting party, except if the event of default is a 'failure to perform other obligations' (in which case, there is a 30-day delay), the non-defaulting party can 'close out' all the repos it has outstanding with the defaulter that are documented under the same legal agreement. This means that all these transactions are terminated and their Repurchase Dates accelerated for immediate settlement. Variation margin held by either party are added to these amounts. Acceleration means fixing the values of obligations owed to and by the defaulter, and converting them into the same currency. Then, the value of the obligations owed to the defaulting party are netted against the value of obligations owed by the defaulting party to leave a residual net amount. This residual may be a net exposure to the defaulter (which has to be pursued by the non-defaulter as an unsecured claim on the defaulter) or a net surplus (which has to be returned to the defaulter). Non-defaulters can add reasonable expenses but cannot seek 'consequential damages' from the defaulter, in other words, compensation for downstream losses incurred as a result of the default. However, the GMRA 2000 does allow for recovery of the cost of replacing the defaulted repos or, if justified, re-hedging or unwinding hedges.
19. In order to calculate the values of obligations owed to and by the defaulting party, the non-defaulting party has to value the collateral held by both parties. The GMRA 2000 offers considerable flexibility to the non-defaulter, in the form of a menu of three alternative valuation methods designed to accommodate illiquid collateral. Thus, the non-defaulter has the choice of using:
 - prices actually realised on the sale of the collateral or other holdings of the same asset; and/or
 - market quotes; or
 - in cases where dealing is not possible and quotes are unavailable or deemed not to be 'commercially reasonable', his own estimation of 'fair value'.

In order to allow time to get market quotes or dealing prices, or to estimate fair value, the deadline for valuation is five business days after default. However, in exceptional circumstances, fair value can be fixed after this deadline.

20. Under the GMRA 2011, the framework for dealing with a default has been modified in a few ways. One change is that a party is in default from the date of the event of default. There is no need to serve a Default Notice to put a party into default. If one of the two automatic events of default occurs, the close-out process starts at once. For other events of default, the non-defaulting party can initiate the close-out at its own convenience by issuing a notice to the defaulter of an Early Termination Date up to 20 days in advance. The five-day deadline for valuing collateral is replaced by a requirement to value collateral on or as soon as reasonably practicable after the chosen Early Termination Date.

What happens if a party fails to deliver collateral?

21. In the event of a failure by a Seller to deliver collateral to the Buyer on the Purchase Date, the GMRA provides that:
- If the parties so elected when they negotiated their GMRA (2000 or 2011), a failure to deliver collateral would be an event of default. Under the GMRA 2000, it is up to the Buyer to serve a Default Notice in order to put the Seller into default and trigger the process of closing out outstanding repos with the defaulter. Under the GMRA 2011, the Buyer decides whether or not to proceed with closing-out. Putting a counterparty into default is a very serious step, with potential market and systemic implications, and should only be taken by senior management. They need to be sure that the failure to deliver reflects credit problems at the counterparty and not temporary operational problems (at the Seller or its custodian, or within the settlement infrastructure) or market illiquidity beyond the control of the Seller.
 - If the Buyer does not put the Seller into default, the Buyer should withhold the Purchase Price from the Seller or, if this has been paid, he should immediately require the Seller to repay or, if necessary, call for cash margin from the Seller.¹⁵
 - Unless the Buyer puts the Seller into default, the contract remains in force until the intended Repurchase Date, unless the Buyer terminates the transaction, which he is entitled to do at any time.
 - At any time while the transaction remains in force, the Seller will be able to deliver the collateral to the Buyer and is entitled to receive the Purchase Price in exchange.
 - If the Buyer terminates the transaction, the Seller will be obliged to pay the Buyer the difference between the Repurchase Price on the day of termination and the original Purchase Price.¹⁶ The difference is the repo interest that has accrued since the Purchase Date. In other words, the Seller will be liable for repo interest from the very start of the repo, even if he delivered the collateral late and

¹⁵ Ideally, the exchange of cash and collateral securities should be delivery-versus-payment (DVP), so a Seller failing to deliver collateral should not receive the corresponding Purchase Price from the Buyer.

¹⁶ Note that, while the Repurchase Price is normally taken to mean the payment due from the Seller to the Buyer on the Repurchase Date, the GMRA also applies the term to the sum of the Purchase Price and repo interest accrued up to any date during the term of the transaction.

therefore only had limited use of the Purchase Price, or even if he never delivered the collateral and therefore never had any use of the Purchase Price.

22. In the event of a failure by a Buyer to deliver collateral back to the Seller on the Repurchase Date, the GMRA provides that:
- If the parties so elected when they negotiated their GMRA (2000 or 2011), a failure to deliver collateral would be an event of default. Under the GMRA 2000, it is up to the Seller to serve a Default Notice in order to put the Buyer into default and trigger the process of closing out outstanding repos with the defaulter. Under the GMRA 2011, the Seller decides whether or not to proceed with closing-out. As emphasised already, placing a counterparty into default is a very serious step, with potential market and systemic implications, and should only be taken by senior management. They need to be sure that the failure to deliver reflects credit problems at the counterparty and not temporary operational problems (at the Buyer or its custodian, or within the settlement infrastructure) or market illiquidity beyond the control of the Buyer.
 - If the Seller does not put the Buyer into default, the Seller should withhold the Repurchase Price from the Buyer or, if this has been paid, he should immediately require the Buyer to repay or, if necessary, call for cash margin from the Buyer (but if the Seller owes any sums to the Buyer, these will be set off against the Repurchase Price).¹⁷
 - Unless the Seller puts the Buyer into default, the contract remains in force until the Buyer delivers or the Seller terminates the transaction, which he is entitled to do at any time.
 - The Seller can trigger a *mini close-out*. This is an informal term used to describe the termination of a failed transaction by the Seller. Under this procedure, the Buyer will be obliged to pay to the Seller the difference between (1) the Default Market Value of the collateral due under the failed transaction (all other repos continue in force), as determined by the Seller and (2) the Repurchase Price due to the Buyer. See paragraph 18 above.
23. The mini close-out is the parallel process in the repo market to the buy-in process used to deal with failed transactions in the cash market. A key difference is that a mini close-out compensates the Seller with net cash compensation, whereas a buy-in aims to supply the security that has not been delivered by the seller and compensate the buyer for the extra cost of buying-in. Another difference is in the methodology applied to the calculation of the payment due to the Seller in a mini close-out compared to that applied in a buy-in by a buyer in the cash market. A mini close-out can use an estimate of fair

¹⁷ Ideally, the exchange of cash and collateral securities should be delivery-versus-payment (DVP), so a Buyer failing to deliver equivalent collateral should not receive the corresponding Repurchase Price from the Seller.

market value, whereas a buy-in depends upon the failed party or an agent purchasing a security from a third party. Therefore, in an illiquid market, a mini close-out can be completed, but a buy-in might not. This means that there is a basis risk where a party has purchased a security in the cash market to deliver to another party on the Repurchase Date of a repo but the cash market seller fails to deliver. If the party consequently fails to deliver on the repo and the other party to the repo (the Buyer) triggers a mini close-out and opts to value the collateral at its fair market value in order to calculate the amount owed by the first party (the repo Seller), the first party would be left with a long position in the cash market. Given the illiquidity of the cash market, the position will not be closed out easily if at all (although some of the market risk might be hedged in the derivatives market).

Repurchase transactions versus buy/sell-backs

24. Repurchase transactions and buy/sell-backs are alternative forms of repo. Buy/sell-backs are economically identical to repurchase transactions and, just as in a repurchase transaction, the collateral in a buy/sell-back is transferred by means of a transfer of legal title.
25. Traditionally, the difference between the two forms of repo was that repurchase transactions were documented under master agreements such as the GMRA and each purchase and repurchase therefore formed a single contract, while buy/sell-backs were undocumented and therefore each purchase and repurchase constituted a separate legal contract. It is not possible to margin undocumented buy/sell-backs or grant permission to substitute to the Seller. In addition, manufactured payments have to be delayed until the Repurchase Date and incorporated into the Repurchase Price. The master agreements governing repurchase transactions set out clear rights of close-out and set-off in the event of default by one of the parties and remedies in the event of a failure to deliver collateral, as well as making provision for initial margins and haircuts, margin maintenance and permission to substitute. In the case of undocumented buy/sell-backs, the lack of documented rights, remedies and provisions means they are legally less robust and less flexible.
26. Undocumented buy/sell-backs are increasingly giving way to the documented version (using, for example, the Buy/Sell-Back Annex of the GMRA) under pressure from regulatory requirements for written legal agreements, margin maintenance and express rights of close-out and set-off. The difference between repurchase transactions and documented buy/sell backs now rests in the response to the payment of a coupon, dividend or other income payment on the collateral.
27. If coupons, dividends or other income are paid on collateral during the term of a buy/sell-back, there is no manufactured payment. Instead, on the Repurchase Date, the amount of income (including the reinvestment income to compensate for delay between the income payment date and the Repurchase Date) is paid to the Seller by deduction from the Repurchase Price.

General collateral and specials

28. It has been explained already that the basic uses of repo are (1) the borrowing and lending of cash on a secured basis and (2) the borrowing and lending of securities. Where a repo is being used as a means of borrowing and lending cash, the Buyer will require collateral of acceptable quality but will not specify a particular issue of securities. Within a particular class of securities, the pool of equally and generally acceptable collateral is called the **general collateral (GC)** basket. Given that the Seller has some choice about which issue of securities he delivers to the Buyer in a GC repo, GC repos are driven by the supply of and demand for cash, which means there should be a single **GC repo rate** for each currency and term to maturity. As GC repo is a money market instrument, the GC repo rate should be closely correlated with other money market rates, particularly unsecured interbank deposit rates. The spread between the GC repo rate and unsecured money market rates will reflect the credit and liquidity risk premia on unsecured lending.
29. At times, potential Buyers will bid in the repo market for a particular issue of securities as collateral. If demand is strong enough, such bidding pressure will force down the repo rate on that particular issue. In other words, competition between potential Buyers will encourage them to offer cheaper cash to potential Sellers in order to get the security they are seeking. When the repo rate quoted on a particular security falls at least about 10 basis points below the GC repo rate for that currency, the security in question is said to have gone **special**. The spread between the GC repo rate and the rate on a special reflects the strength of demand for a particular security and, other things being equal, should be equal to the borrowing fee that would have to be paid to borrow that security in the securities lending market. When the GC repo rate is low and/or the borrowing fee is large, it is possible for specials to trade at negative repo rates, even when other interest rates are positive.

Market structure and infrastructure

30. Most very short-term repos in Europe are traded across **automatic repo trading systems (ATS)**. The bulk of such electronically-traded repos are 'cleared' across **central clearing counterparties (CCP)**. A CCP is a specialist intermediary that interposes itself as a principal into every transaction registered with it, to become the seller to every buyer and the buyer to every seller. The CCP also nets opposite repos and reverse repos with the same counterparty and thereby reduces the credit risk and operational cost of transactions (although CCP are otherwise more expensive because of the size of the initial margins they impose on collateral).
31. Longer-term and structured repos tend to be traded directly between counterparties, using the telephone and electronic messaging systems. Some repos are arranged by agents called **voice-brokers**. Directly-traded and voice brokered repos can be registered with CCP for clearing after they have been agreed between counterparties.

32. The settlement of repos, and the management of post-trade tasks such as margining and manufactured payments, is usually managed by the operations departments of the counterparties. For settlement, they send instructions to deliver and receive securities to the securities settlement systems (SSS) operated by domestic **central securities depositories (CSD)** or **international central securities depositories (ICSD)**, either directly or via custodian banks acting as settlement agents. ICSD tend to be the preferred securities depository for international investors and global intermediaries.
33. However, some parties outsource the settlement and management of certain directly-traded repos to **tri-party repo agents**. Tri-party agents undertake the settlement, custody and post-trade management of repos. Settlement is made by book-entry transfers between accounts on the books of the tri-party agent and so avoids the cost and occasional difficulty of settling in a CSD. The services of tri-party agents include the automatic selection of collateral from the account of the Seller, subject to the predefined collateral requirements of the Buyer, and the subsequent automatic 'optimisation' of collateral.
34. Optimisation usually means ensuring that the collateral held by the Buyer is always of the lowest quality acceptable to the Buyer (this means the Seller is making the most efficient use of his collateral by using his worst collateral first, while the Buyer is earning the highest return by accepting the riskiest acceptable collateral). Optimisation is achieved by substituting existing collateral with new collateral whenever the Seller purchases a security of lower but still acceptable quality. The tri-party agent will also substitute when the Seller wishes to sell a security he has repoed out as collateral, when collateral is no longer acceptable to the Buyer (eg because of a ratings downgrade) and when collateral is due to make an income payment (which might cause tax problems).
35. Tri-party repo is popular with Buyers who lack the operational capability to settle securities and manage collateral, and for non-government securities, which tend to be less liquid and trade in smaller amounts and so are more expensive to settle at CSD than government securities.
36. Tri-party agents also provide automated collateral management services to **GC pooling systems** (also known as GC financing systems). These are ATS which are connected to CCP and then to tri-party agents. The systems provide markets in GC baskets, which means that each system offers trading in a number of lists of security issues. Users of the system accept that any of the issues listed in a basket that they are trading, which they happen to hold in their account at a CSD or ICSD, may be selected by the tri-party agent for delivery if they are a Seller. Buyers accept that any of these listed issues may be delivered into their account. Users therefore trade on the basis of price, amount and term only, not the identity of the collateral. This makes trading more efficient. The ATS

registers repos and reverse repos transacted by each user with the CCP, which sends the net amounts sold or bought by each user to the tri-party agent, which automatically selects the required amounts of listed securities from the accounts of the net Sellers and instructs the CSD or ICSD to deliver them to the accounts of the net Buyers.

Annex II - Glossary of repo terminology

Where terms are used in the Global Master Repurchase Agreement (GMRA), they are indicated by Capital Initials. Reference should always be made to the GMRA for the exact definition of these terms. References to terms defined elsewhere in the glossary are in *italics*.

accrued interest

Part of the *Market Value* of a fixed-income security. On any particular day during the life of a security, accrued interest is the amount corresponding to the share of the next coupon payment which is owed to whoever is the owner of the security on that day but is not yet due for payment by the issuer. Market Value is equal to the agreed *clean price* of the security times its *nominal* value plus the outstanding accrued interest (see the formula below).

$$\text{Market Value} = \text{nominal value} \left(\frac{\text{clean price}}{100} + \frac{\text{coupon} \times \text{day count}}{100 \times \text{annual basis}} \right)$$

The clean price of a security plus accrued interest expressed in price terms (as a percentage of the nominal value of the security) gives the *dirty price* (see the formula below).

$$\text{dirty price} = \text{clean price} + \frac{\text{coupon} \times \text{day count}}{\text{annual basis}}$$

$$\text{Market Value} = \text{nominal value} \left(\frac{\text{dirty price}}{100} \right)$$

Fixed-income securities being used as *collateral* in the repo market should be valued inclusive of accrued interest (this is called ‘full accrual pricing’, as opposed to ‘flat pricing’, which is valuation at the clean price).

It is common market practice, when calculating the Market Value of *Margin Securities* to include accrued interest up to and including their delivery date. However, the *GMRA* specifies accrued interest only up to and including the day of the calculation.

Adjustment

In the *GMRA*, an alternative method of *Margin Maintenance* to *variation margin* (called *Margin Transfer* in the *GMRA*) as a means of eliminating a *Net Exposure*. Adjustment means terminating a *repo* and creating a Replacement Transaction for the remaining term to maturity, with the quantity of *collateral* increased or

decreased to bring its *Market Value* into line with the cash owed by the *Seller*. There are two ways of doing this.

- The first method is to bring the Market Value of the collateral into line with the *Repurchase Price* on the so-called Adjustment Date plus any *haircut* or *initial margin* (called *Margin Ratio* in the GMRA). The Repurchase Price will be equal to the *Purchase Price* (how much cash was loaned at the start) plus the *repo interest* accrued to the Seller by the Adjustment Date.

new Market Value \approx latest Repurchase Price x Margin Ratio

or

new Market Value $\approx \frac{\text{latest Repurchase Price}}{1 - \text{haircut}}$

- The second method is to pay off ('clean up') the repo interest owed to the *Buyer* --- by means of a cash payment from the Seller to the Buyer --- and bring the Market Value of the collateral into line with the original *Purchase Price* of the repo plus any haircut or initial margin. This method returns the cash value of the repo to its original amount.

new Market Value \approx original Purchase Price x Margin Ratio

or

new Market Value $\approx \frac{\text{original Purchase Price}}{1 - \text{haircut}}$

Note that, where collateral securities are issued in minimum denominations, the new Market Value may have to be slightly larger than the Repurchase Price or Purchase Price being targeted.

Adjustment is applied in turn to each repo outstanding between two parties, starting with the transaction with the largest *Transaction Exposure*, until the Net Exposure between the parties is reduced to an immaterial level. The collateral transfers of the terminated transaction and the Replacement Transaction should be netted where possible, in which case, only the difference between the original and new Market Values of collateral will actually have to be delivered. By netting, Adjustment produces what is, in effect, a variation margin.

The parties can take the opportunity of an Adjustment to agree a complete or partial substitution of collateral by returning different securities in the Replacement Transaction.

Adjustment was designed for *Buy/Sell-Backs* but can be applied to Repurchase Transactions. The other alternative method, called *Repricing*, involves changing

the Purchase Price rather than the Market Value of the collateral. See GMRA 2000 paragraph 4(k) and GMRA 2011 4(l). See also Guide 3.55-3.58.

affirmation

A process in which (1) one party contacts the other by telephone or e-mail in order to secure immediate verification from the other party of the key economic terms of one or more selected new transactions and their settlement instructions or (2) both parties report details of all new transactions to a third-party automatic affirmation service, which makes comparisons and identifies mismatches. The function of an affirmation overlaps that of a *Confirmation*. See Guide 2.54-2.57.

agency repo

A *repo* executed by an agent with a third party on behalf of one or more customers. The risk on the transaction is between the third party and the customer(s). Where an agent deals on behalf of several customers, shares in the repo with the third party are allocated post trade among the customers, creating separate repos between the third party and each customer. The relationship between the agent and the third party is documented under a single master agreement, such as the *GMRA*, signed by the agent and the third party. In the case of the *GMRA*, the standard agreement has to be supplemented by the Agency Annex. There will be separate agreements between the agent and his customer(s), which may cover more business than just repos. When dealing with an agent, a third party will need to know the identity of the customer(s), in order to be able to calculate his credit exposure and fulfil regulatory requirements such as anti-money laundering checks. However, for commercial reasons, the front office of the third party is usually not told the identity of the customer(s) but is given a codename for each customer. Only the credit department or similar department of the third party is given the key. The same *GMRA* can be used by a party to deal as an agent and also on its own account. It is vital, in this situation, when negotiating a repo, to inform the third party whether one is transacting as a principal or an agent. This is a contractual requirement under the *GMRA*.

annual basis

The number of days that are conventionally assumed to be in one year for the purpose of calculating the amount of return from an annualised percentage rate of return. The annual basis is conventionally denoted by the letter B and is the denominator of the *day count fraction* (D/B), where the numerator is the *day count* of the term of the transaction. There are often different conventions for the annual basis in the money market and capital market of the same currency.

Business Day

A day on which a transaction can be settled by means of delivering securities and/or making payments of cash. Actions required to fulfil the contractual obligations of a transaction, such as the service of notices and other communications, can also only be performed on a Business Day. The ability to deliver securities and/or make payments of cash requires that the relevant securities settlement systems (SSS) and/or cash payment systems be open for business. Weekends are therefore not Business Days. Public holidays are also

usually not Business Days. However, in the eurozone, cash payments can be made in euros on any day on which the *TARGET2* inter-central bank payments system is open, regardless of whether payments systems are operating in individual eurozone member states. *TARGET2* closes only on New Year's Day, Easter Friday and Monday, May Day, Christmas Day and the day after Christmas Day.

Given that securities may have to be delivered between two SSS or between two custodian banks, and given also the possibility of *cross-currency repos*, the *Purchase Date* and *Repurchase Date* of a *repo* may have to be a Business Day in more than one city.

Under the *GMRA* 2000 2(e) and 2011 2(f), a Business Day is defined as:

- for repos to be settled at an SSS, any day on which that system is open for business;
- for repos to be settled by delivery of securities at a custodian bank, any day on which that bank is open for business, as well as a day on which banks generally are open for business in the city which hosts the central bank payments system for the currency of payment or, in the case of the euro, any day on which the *TARGET2* system is open.

The *GMRA* does not define what is meant by the close of business. This can be important, as notices served after the close of business will not become effective until the next Business Day (which, in a crisis, might be delayed). It is best practice for parties to agree a time for close of business in the countries in which they operate, where there is uncertainty, and record it in Annex I of their *GMRA* or in *Confirmations*. See Guide 2.13-2.15.

Buyer

In the *GMRA*, this is the party to a *repo* who buys *collateral* at the *Purchase Price* on the *Purchase Date* and commits to sell back the same quantity of *equivalent collateral* on the *Repurchase Date* --- which will be a fixed maturity date or, in the case of *open repo*, on demand --- at an agreed or calculable *Repurchase Price*. The Buyer is effectively a lender of cash and is said to be doing a *reverse repo*.

buy-in

A procedure that can be initiated by the buyer of a security in a *cash trade* following a *failure to deliver* that security by the seller on time and/or in full. Under the *ICMA's* Rules and Recommendations (Section 450), a party affected by a *fail* can remedy the problem by arranging to 'buy in' the security from a third party. He has to give the failing party four to ten *Business Days'* notice of his intention to do so. If the failing party does not remedy the fail within the notice period, the failed party can appoint an agent to buy in the security in the 'best available market for *guaranteed delivery*' or can do so itself. Any excess in the cost of the buy-in over the price agreed originally with the failing party is charged to the latter (and vice versa). If party A has failed on party B because

party C has failed on party A, party A can pass on the buy-in notice and any costs to party C. In a *repo* under the *GMRA*, the response to a failure to deliver is not a buy-in but termination of the failed repo and cash compensation. In the case of a failure by the Buyer to deliver on the Repurchase Date, the cash compensation procedure is a *mini close-out*.

Buy/Sell-Back

Another term for a *Sell/Buy-Back*. Strictly-speaking, this is a sell/buy-back from the point of view of the *Buyer*. Sometimes abbreviated to 'buy/sell'. In some countries, there are also domestic names for this type of repo.

Buy/Sell-Backs are economically identical to *Repurchase Transactions*. Just as in a Repurchase Transaction, the *collateral* in a Buy/Sell-Back is given by means of a transfer of legal title. One difference is that Buy/Sell-Backs are not necessarily documented under a *master agreement*. In the case of undocumented Buy/Sell-Backs, the two legs of the transaction form separate contracts. Because of this, it is not possible to *variation margin* undocumented Buy/Sell-Backs or grant *permission to substitute collateral* to the *Seller*. Because of the lack of documentation, there is also no express provision for: *initial margins* and/or *haircuts* at the start; or *close-out netting* in an *Event of Default* by either party.

Since 1995, it has been possible to document Buy/Sell-Backs using the Buy/Sell-Back Annex of the *GMRA*. Undocumented Buy/Sell-Backs are increasingly giving way to the documented version under pressure from regulatory requirements for written legal agreements, variation margin and express rights of close-out netting.

The only material difference between Repurchase Transactions and documented Buy/Sell-Backs is how coupon, dividend or other income payments made on collateral during the life of a transaction are managed. In a Buy/Sell-Back, there is no *manufactured payment*, as in a Repurchase Transaction. Instead, the value of the income payment is deducted from the *Repurchase Price* due on the *Repurchase Date* together with an amount of interest to compensate for the delay in compensating the *Seller*.

Cash Equivalent Amount

Under the *GMRA* 2011, a party making a call for *variation margin* (called a *Margin Transfer* in the *GMRA*) has the right to call for the return, as part of the variation margin, of *Margin Securities* which it had previously given to the party as variation margin. Where a party exercises this right but the other party is unable to immediately return those securities through no fault of their own, the other party has to provide an interest-free *Cash Margin* instead. The other party is then given at least two days to find the *Margin Securities* being recalled. If the recalled *Margin Securities* are not returned by the deadline, the other party must substitute the *Cash Margin* with another cash amount called the *Cash Equivalent Amount*. But while the *Cash Margin* is calculated using the securities valuation methodology for *Margin Maintenance*, the *Cash Equivalent Amount* is

calculated using the default methodology of the GMRA. See GMRA 2011 paragraph 4(h).

Cash Margin

Under the *GMRA*, a *variation margin* (called a *Margin Transfer* in the GMRA) given in the form of cash.

cash trade

An outright sale or an outright purchase of a security (with no obligation, as in a *repo*, to buy or sell back that security in the future).

CCP

The acronym for a *central counterparty* or *central clearing counterparty*. A CCP is a specialist intermediary, part of the infrastructure of the OTC market, which interposes itself into every transaction registered with it by its members, to become the seller to every buyer and the buyer to every seller. The CCP then nets opposite transactions with each counterparty to produce a single *variation margin* call between them as well as net deliveries and payments. *Netting* reduces the credit risk and operational cost of transactions. Unlike the bilateral netting of opposite transactions that is possible between two parties, netting by a CCP is multilateral. For example, if parties A, B and C are members of the same CCP, once cleared, sales by A to B can be netted against purchases by A from C, given that the CCP will step in between A, B and C as the common counterparty. Multilateral netting is therefore more effective in reducing exposures than is bilateral netting.

Apart from netting its exposures, the CCP protects itself against a default by a member by taking initial margins from both parties upon the registration of a transaction, transferring variation margins between members to eliminate exposures on at least a daily basis, maintaining its own capital, requiring members to contribute to a default fund and, in the event of a default by one or more members, having the right to share remaining losses among surviving members. The CCP will also require its members to assist in closing out transactions with a defaulting member. See Guide 2.26.

classic repo

Another name for a *Repurchase Transaction*.

clean price

The price of a fixed-income security as generally quoted in the secondary cash market for that security. It measures the capital value of the security in the market but excludes the *accrued interest* on the security.

clearing

A term which means the *netting* by a third party of opposite mutual obligations between two other parties. Netting can be used to reduce (1) operational risk and cost or (2) credit risk.

- Clearing for operational reasons can be performed by *custodian* banks, *CSD* or *ICSD*, acting as agents, in order to reduce the volumes of deliveries of securities and payments of cash needed to settle transactions. Clearing for operational reasons is sometimes called *technical netting*. It is not legally binding so does not reduce credit risk.
- Clearing to reduce credit risk is performed by *CCP*, acting as principals by means of 'novation' or by 'open offer'. Netting by novation as performed

by a CCP means the creation of two new contracts from an original. The original contract is that between the original parties to a transaction. When this contract is registered with the CCP, the original contract is replaced by two new contracts: a new contract between the seller and the CCP; and a new contract between the CCP and the buyer. In this way, the CCP becomes the buyer to every seller and the seller to every buyer. Under open offer, when the buyer and seller transact, contracts are automatically and immediately created between each party and the CCP. At no stage under open offer is there a contract directly between the buyer and seller.

close-out netting

A contractual provision under which, upon the occurrence of a pre-defined *Event of Default* in relation to one of the parties, the mutual obligations of both parties under the contract, whether due and payable or not, are automatically or at the election of the other party, reduced to or replaced by a single net obligation, which is thereupon immediately due and payable by one party to the other. Under the *GMRA*, the Non-Defaulting Party terminates the agreement by accelerating all outstanding transactions with the defaulter for immediate settlement, along with any *variation margins* (called *Margin Transfers* in the *GMRA*) still held by the parties. Alternatively, if the Event of Default is an Act of Insolvency which is either the filing of an insolvency petition or the appointment of a liquidator, or similar events, the termination is automatic. The obligations are valued and converted into the same currency by the Non-Defaulting Party. Then, the gross value of the accelerated obligations owed to the defaulting party is netted against the gross value of the accelerated obligations owed by the defaulting party to leave a residual net amount. This residual 'close-out' amount may be a net exposure to the defaulter (which has to be pursued by the non-defaulting party as an unsecured claim on the defaulter) or a net surplus (which has to be returned to the defaulter). Close-out netting should be quicker, less expensive and more certain than the statutory insolvency process. See *GMRA* paragraph 10.

collateral

Legally-speaking, collateral is an asset owned by a borrower to which a *security interest* has been attached in order to provide security to a lender. A security interest is a property interest in the asset which entitles the lender to seize and liquidate the collateral in the event that the borrower defaults, although only usually after its claim has been validated by an insolvency court. The borrower retains a property interest in the asset, which means that, absent a default by the borrower, the asset cannot be sold by the secured lender, unless the borrower has given him a right of *re-hypothecation*. Upon discharge of the debt by the borrower, the secured lender must return the same asset. A *pledge* is a type of security interest in which the asset acting as collateral is transferred from the pledgor into the control and possession of the pledgee.

The term 'collateral' is used colloquially in the *repo* market to describe an asset sold in a repo. This is not legally correct, as a repo transfers full legal title to the

Collateral Assets (CA)

asset from the *Seller* to the *Buyer* for the term of the transaction. The Seller retains no property interest in the asset and the Buyer has the unfettered right to sell the asset to a third party at any time and without the permission of the Seller. The term is not used in the *GMRA*.

A type of *collateral* in a categorisation by the BIS Committee on the Global Financial System (CGFS). CA is the broadest of three categories and encompasses all assets that qualify for use in collateralised funding transactions, such as in covered bonds, agency and private-label mortgage-backed and asset-backed securities. The other CGFS categories are *High Quality Assets (HQA)* and *High Quality Liquid Assets (HQLA)*.

collateral downgrade trade

Either:

- A securities loan of an asset or basket of assets from party A to party B against collateral from party B of another asset or basket of assets of lower liquidity and sometimes lower credit quality in return for the payment of a fee by party B.
- A combination of (1) a short-term *repo* of an asset or basket of assets from party A to party B and (2) a *reverse repo* of another asset or basket of assets of lower liquidity and sometimes lower credit quality to party A from party B for the same maturity date.

The net result is an exchange by party A of higher quality collateral for lower quality collateral (a downgrade for A). The reduction in quality will be reflected in a spread to party A between the lower repo rate it pays and the higher reverse repo rate it receives (repo rates reflecting, among other things, the quality of the collateral). A collateral downgrade trade is an example of *collateral transformation*. A collateral downgrade trade for one party is a *collateral upgrade trade* for the other.

collateral upgrade trade

Either:

- A securities loan of an asset or basket of assets to party A from party B against collateral from party A of another asset or basket of assets of lower liquidity and sometimes lower credit quality in return for the payment of a fee by party A.
- A combination of (1) a short-term *reverse repo* of an asset or basket of assets to party A from party B and (2) a *repo* of another asset or basket of assets of lower liquidity and sometimes lower credit quality from party A to party B for the same maturity date.

The net result is an exchange by party A of lower quality collateral for higher quality collateral (an upgrade for A). The increase in quality will be reflected in a spread paid by party A that is the difference between the lower reverse repo rate it receives and the higher repo rate it pays (repo rates reflecting, among other things, the quality of the collateral). A collateral upgrade trade is an example of *collateral transformation*. A collateral upgrade trade for one party is a *collateral downgrade trade* for the other.

collateral swap

Also known as a *liquidity swap*. An exchange of an asset or basket of assets for another asset or basket of assets of lower liquidity and sometimes lower credit quality, either (1) directly, through a *securities lending* transaction, or (2) via a combination of a *repo* of the lower quality asset or assets and a matching *reverse repo* of the higher quality asset or assets between the same parties. A collateral swap is an example of *collateral transformation*. It differs from *collateral downgrade or upgrade trades* in that it is for longer than one year.

collateral transformation

Exchanging assets of different liquidity and sometimes different credit, usually through *collateral/liquidity swaps* or *collateral downgrade/upgrade trades*, which can take the form of *securities lending* transactions or combinations of *repos* and matching *reverse repos* between the same parties.

Confirmation

A Confirmation is a comprehensive record in writing (which can be electronic) setting out:

- the economic terms of a transaction (price, term, amount, etc);
- any ad hoc terms (not already included in or different from those in the *master agreement* between the parties); and
- settlement accounts and addresses (to and from which deliveries and payments should be made).

A Confirmation may also have to include statements required by local regulation or law.

A Confirmation should be sent promptly, as soon as possible after a transaction has been agreed, preferably on the same day. It should be sent by one party to another or by each party to the other. Parties receiving Confirmations should urgently cross-check in order to identify mistakes in recording the terms or disagreements about what has been agreed. Mistakes or disagreements should be promptly notified by the recipient to the other party and mutual action initiated to resolve the problem. A Confirmation plays a key role in the legal construction of the transaction. Whereas the *GMRA* and Annex I set out the general terms and conditions of the business relationship between the parties, a Confirmation describes terms and conditions specific to the transaction.

A Confirmation is *prima facie* evidence of the terms and conditions of a transaction, unless promptly challenged with stronger contrary evidence. Moreover, any ad hoc terms or conditions set out in a Confirmation take precedence for the transaction being confirmed over any conflicting standard terms or conditions set out in the master agreement.

The essential terms which should be included in a repo Confirmation are set out in *GMRA* paragraph 3(b) and a sample Confirmation is given in Annex II of the *GMRA*. For transactions executed over an automatic repo trading system, traditional Confirmations tend to be substituted by the notifications generated

by the trading system. The function of a Confirmation overlaps that of an *affirmation*. See Guide 2.34-2.57 and 4.26-4.27.

corporate value date

In a *repo*, the *Purchase Date* on which cash and *collateral* are exchanged is usually a money market value date rather than a capital market settlement date. However, where one party (typically a customer) cannot manage this earlier settlement, the value date of the repo may be deferred until the capital market settlement date, which is then referred to as a 'corporate value date'. Thus, if non-forward repos are settled at T+2, a corporate value date would be T+3. See Guide 2.10.

cost of carry

The difference between the amounts of *accrued interest* and *repo interest* earned over the term of a *repo*. A positive (negative) cost of carry means that a long position in a security will earn more (less) accrued interest than it costs to finance that position by repoing out that security. The cost of carry is required to calculate the *forward price* of a security.

$$\text{cost of carry} = \left(\text{nominal value} \frac{\text{coupon} \times \text{day count}}{100 \times \text{annual basis}} \right) - \left(\text{Purchase Price} \frac{\text{repo rate} \times \text{day count}}{100 \times \text{annual basis}} \right)$$

credit repo

A *repo* against *collateral* other than government securities. On the cusp between government and credit repos are 'high grade' repos, which are transactions in high-quality collateral such as supranational, sovereign and agency securities (SSA).

cross-currency repo

A *repo* of a *Purchase Price* in one currency against *collateral* with a *Market Value* denominated in another currency.

CSD

The acronym for a *central securities depository*. A CSD is a specialised domestic institution, part of the market infrastructure, which records (1) holdings of domestic securities, by providing accounts for the holders or their agents, and (2) changes in holdings, nowadays usually by means of opposite entries in these accounts (book-entry transfer), rather than by the movement of physical certificates. To allow book-entry transfer, securities are either 'dematerialised' or 'immobilised'. Most CSD are linked to independent large value payment systems operated by central banks. Cf *ICSD*.

custodian

A bank managing the delivery and receipt of securities, and any exchanges of cash, as an agent on behalf of other institutions. The custodian may settle deliveries and receipts with *CSD*, *ICSD* or other custodians. Deliveries between two customers of a custodian may be settled within the custodian by book-entry transfer of ownership between accounts.

day count

The number of days that are conventionally assumed to be in the term of a transaction, from and including the value date up to but excluding the maturity date, for the purpose of calculating the amount of return from an annualised

percentage rate of return. The day count is conventionally denoted by the letter D and is the numerator of the *day count fraction* (D/B), where the denominator is the *annual basis*. There are often different conventions for the day count in the money market and capital market of the same currency.

day count fraction

The ratio of the *day count* (D) to the *annual basis* (B). The day count fraction is used to calculate the amount of return from an annualised percentage rate of return. It is the assumed fraction of the year over which a transaction runs.

$$\text{repo interest} = \text{Purchase Price} \left(\frac{\text{repo rate} \times \text{day count}}{100 \times \text{annual basis}} \right)$$

default

A failure by one party to a transaction to perform one of the obligations to which it is contractually committed and for which the parties have agreed that failure would constitute an *Event of Default*. The most important Events of Default are acts of insolvency.

delivery repo

A *repo* in which the *collateral* moves from the control and possession of the *Seller* or its agent to the control and possession of the *Buyer* or its agent for the term of the transaction. Delivery is required in some jurisdictions to prove that title to the collateral has been transferred. Only delivery repos are covered by the EU Financial Collateral Directive and delivery is a regulatory condition for the re-use of collateral under the EU Securities Financing Transaction Regulation (SFTR). Cf *hold-in-custody repo* and *tri-party repo*.

dirty price

The price of a fixed-income security including *accrued interest*, from which the *Market Value* of the security can be directly calculated. Cf *clean price*.

$$\text{dirty price} = \text{clean price} + \frac{\text{coupon} \times \text{day count}}{\text{annual basis}}$$

DVP

The acronym for 'delivery versus payment', which means delivery of a security against a simultaneous exchange for cash. Cf *FOP*.

End/End rule

The convention that normally applies in the foreign exchange and money markets for periods that are multiples of one month and for which the value date is the last *Business Day* of a calendar month. The End/End rule specifies that the maturity date is the last Business Day of the calendar month at the end of the period. For example, a 3-month deposit for value on 28 February (in a non-leap year) matures not on 28 May but on 31 May (or, if that is not a Business Day, then the nearest preceding Business Day in May). See also the *Modified Following Business Day convention*.

equivalent

On the *Repurchase Date* or termination date of a repo, the *Buyer* is obliged to return equivalent collateral to the *Seller*. Equivalent collateral is economically but not legally identical to that sold to the Buyer on the *Purchase Date*, that is, it is from the same security issue (eg same ISIN) but not the same part of the same

issue (if the securities took the form of physical certificates, the Buyer would be able to sell a certificate back to the Seller with a number different to the one he had bought from the Seller at the start). This flexibility is needed because, during the term of the repo, the Buyer should have the right to sell the securities to a third party, in which case, he would subsequently have to buy back the securities from the market in order to settle with the Seller on the Repurchase Date. The securities obtained by the Buyer are very unlikely to be the same part of the issue received on the *Purchase Date*. The use of the term 'equivalent' allows the Buyer to return another part of the same issue. This flexibility makes it practicable for the Buyer to sell to a third party, which is important in allowing him to exercise his property rights as the legal owner of the collateral. If this was not possible, the character of a repo as a sale and repurchase could be challenged. The use of the term 'equivalent' also allows the legal definition of collateral in a repo to accommodate collateral in the form of equity, which can be transformed during the term of a repo by corporate events such as take-overs, rights issues, etc. The terms 'fungible', 'substantially the same' and 'same or similar' are sometimes used instead of 'equivalent'.

ERCC

The acronym for the European Repo and Collateral Council (ERCC), which is a regional sub-committee of the International Repo and Collateral Council established by ICMA to represent member firms active in the repo and/or collateral markets in Europe. Among other things, the ERCC provides guidance on the maintenance of the *GMRA*, publishes the *Guide to Best Practice in the European Repo Market*, organises a semi-annual survey of the European repo market and runs educational events. It also represents the market in consultations by regulatory authorities and in discussions with service providers to improve market infrastructure. Membership of the ERCC is open to all ICMA members who, among other things, have a dedicated repo and/or collateral management activity. Details of the European repo market survey and the other activities of the ERCC can be found on the ICMA website, www.icmagroup.org.

Event of Default

An adverse event, action or failure to act which parties to a master agreement accept will constitute a breach of the contract between them. The *GMRA* lists a set of standard Events of Default. The most important are acts of insolvency. Under the *GMRA*, upon an Event of Default by one party, the other party can initiate *close-out netting*. See *GMRA* 10.

evergreen repo

An open or a fixed-term transaction where both parties have an option to terminate the transaction on any Business Day subject to a notice period to terminate that is longer than the conventional non-forward settlement period. The extended notice period means that the Seller has funding for a guaranteed minimum term (the notice period). Common termination notice periods are 15 or 31 days. See Annex III to the Guide.

exposure threshold

The *Net Exposure* below which the parties to a *repo* may agree not to call for *Margin Maintenance*. When Net Exposure reaches or breaches the exposure threshold, the convention in the repo market is for the Net Exposure to be

completely eliminated. For this reason, in the repo market, the threshold is often also called a *minimum transfer amount*. In the derivatives market, exposure threshold and minimum transfer amount are different. See Guide 3.40-3.44.

extendible repo

A fixed-term transaction under which:

- the Seller has the option to defer the Repurchase Date for an agreed further term, subject only to an agreed and short notice period (no more than the conventional non-forward settlement period, ie T+0, T+1 or T+2);
- the Seller can exercise the option to extend either (1) on any Business Day during the original term or (2) only on certain agreed Business Days within the original term;
- *repo interest* is to be paid on (1) the original Repurchase Date, if the transaction is not extended, and/or (2) the new Repurchase Date, if the transaction is extended;
- both parties can, on the Business Day on which notice is given of an extension, request a change in the repo rate for the additional term to maturity;
- the Seller can, on the Business Day on which notice is given of an extension, request to substitute the collateral with an alternative acceptable to the Buyer for the additional term to maturity.

Extendibles are described using three numbers, eg 4-3-4.

- The first number is the initial term of the repo in terms of round months (4 months in the case of a 4-3-4). This is the minimum term of the repo.
- The second number gives the number of round months before the Repurchase Date which fixes the date on which the Seller can exercise his option to extend the repo (3 months before the Repurchase Date in the case of a 4-3-4). If the repo is not extended, then there may be other opportunities to extend, perhaps each month thereafter until the option is exercised or the repo matures unexercised.
- The third number is the number of months for which the repo can be extended (4 months in the case of a 4-3-4 repo).

See Annex III to the Guide.

failure to deliver

The failure by one party to a *cash trade* or *repo* to deliver the full amount of securities to the other party on the agreed settlement date. Failure to deliver therefore includes partial delivery and late delivery. In a *repo*, failure to deliver can occur on the *Purchase Date* (the *Seller* fails) or on the *Repurchase Date* (the *Buyer* fails). Under the *GMRA*, the parties can agree, in advance when they negotiate their agreement, to treat failure to deliver as an *Event of Default*. If failure to deliver is not chosen, the remedy is termination of the failed repo and cash compensation. In the case of a failure by the Buyer to deliver on the

Repurchase Date, the cash compensation procedure is a *mini close-out*. Failure to deliver on a *cash trade* may result in a *buy-in*. See Guide 4.1.

floating-rate repo

A *Repurchase Transaction* in which the *repo rate* is periodically re-fixed by reference to an interest rate index such as ~~EONIA~~ €STR (in the case of ~~EONIA~~ €STR or other *overnight* or *tom/next* index, the repo rate would be re-fixed daily). Accordingly, the final *Repurchase Price* of a floating-rate repo will not be known until the *Repurchase Date* or later, when the final floating rate is fixed. The repo rate may incorporate a spread under or over the index (eg ~~EONIA~~ €STR minus 3 basis points). Floating-rate repos are term repos in that they are transacted for more than one day. Open repo resemble floating-rate repo, given that an open repo rate can, in principle, be re-fixed on any Business Day but this is not scheduled, as it would be in a floating-rate repo. See Guide 2.19.

FOP

The acronym of ‘free of payment’, which means the delivery of a security without a simultaneous exchange of cash. Transfers of *Margin Securities* are made FOP. Cf *DVP*.

forward price

The traditional method of quoting *Buy/Sell-Backs*, although many are now quoted in terms of their *repo rate*. The forward rate is the forward break-even price of the *collateral* on the *Repurchase Date* of the repo and is equal to the final *Repurchase Price* of the collateral minus its *cost of carry*, quoted as a percentage of the nominal value of the collateral. The forward price shows the level above which the *clean price* of a security needs to be trading on the Repurchase Date of a repo for the Seller to make a profit by selling off the collateral when he gets it back at the end of the repo. There are two alternative formulae for the calculation of the forward price.

Formula (1)

$$\text{forward price} = \frac{R - \left(N \times \frac{C \times D}{100 \times B} \right)}{N} \times 100$$

where

R	Repurchase Price
N	nominal value of the collateral
C	coupon on the collateral
D	number of days according to the applicable convention from and including the last coupon payment date to but excluding the Repurchase Date
B	annual basis for the collateral

Worked example: calculating the forward price of a sell/buy-back

Consider a 1-week sell/buy-back against EUR 100 million nominal of the DBR 2½% of 4 January 20XX. The Purchase Date is 23 February 20XX. The security is trading at a clean price of 93.985 and has 89 days of accrued interest. The dirty price is therefore 94.59458904 and the Purchase Price of the sell/buy-back is EUR 94,594,589.04. An equivalent repurchase transaction is quoted at 1.00% and would have a Repurchase Price of EUR 94,612,982.43. The forward price of the sell/buy-back is:

$$\text{forward price} = \frac{R - \left(N \times \frac{C \times D}{100 \times B} \right)}{N} \times 100$$

$$= \frac{94,612,982.43 - \left(100,000,000.00 \times \frac{2.5 \times 96}{100 \times 365} \right)}{100,000,000.00} \times 100 = 93.95544819$$

Formula (2)

$$\text{forward price} = \frac{\left(N \times \frac{M}{100} \right) - \left(\left(N \times \frac{C \times D}{100 \times B_c} \right) - \left(P \times \frac{R \times D}{100 \times B_r} \right) \right)}{N} \times 100$$

where

M	clean price of the collateral as quoted in the appropriate <i>cash market</i>
N	nominal value of the collateral
C	coupon on the collateral
D	day count according to the applicable convention from and including the Purchase Date to but excluding the Repurchase Date
B_c	annual basis for the collateral
P	Purchase Price of the sell/buy-back (see the Guide 2.7)
R	repo rate on equivalent repurchase transactions
B_r	annual basis for the repo

Worked example: calculating the forward price of a sell/buy-back

Consider the previous example. The forward price using the second formula is:

$$\text{forward price} = \frac{\left(N \times \frac{M}{100} \right) - \left(\left(N \times \frac{C \times D}{100 \times B_c} \right) - \left(P \times \frac{R \times D}{100 \times B_r} \right) \right)}{N} \times 100$$

$$= \frac{\left(100,000,000 \frac{93.985}{100}\right) - \left(\left(10,000,000 \frac{2.5 \times 7}{100 \times 365}\right) - \left(94,594,589.04 \frac{1.0 \times 7}{100 \times 360}\right)\right)}{100,000,000} \times 100$$

$$= 93.95544819$$

forward repo

A *repo* with a *Purchase Price* on a forward date (that is, a date after the latest conventional date for delivery or payment for present value) and a *Repurchase Price* on a later forward date. See GMRA Annex I, Part 2, and also Guide 2.16-2.18.

general collateral (GC)

Where the *Seller* in a repo has some choice about precisely what *collateral* to deliver to the *Buyer*, eg which issue of a security. For example, a *Buyer* may be willing to accept any of a number of government bond issues as collateral. GC repos are therefore driven by the need to borrow and/or lend cash, rather than the precise identity of the collateral. For this reason, GC repo is sometimes described as ‘cash-driven’ repo. The cash imperative also means that there will be a common GC repo rate for each currency and term to maturity. Securities qualifying as ‘general collateral’ are substitutes with each other for the purpose of collateralization, which means they come from the same class of securities.

GC repos constitute money market transactions and the GC repo rate should therefore be highly correlated with other money market rates. The spread between the GC repo rate and unsecured money market rates will reflect the credit and liquidity risk premia on unsecured lending. See Guide 2.27.

GMRA

The acronym for the *Global Master Repurchase Agreement*, which is the *master agreement* for *Repurchase Transactions* published by the ICMA. It can be extended to include *Buy/Sell-Backs* by applying the *Buy/Sell-Back Annex*. The latest version of the GMRA was published in 2011, and superseded that published in 2000, which superseded the 1995 version. See www.icmagroup.org.

GMSLA

The acronym for the *Global Master Securities Lending Agreement*, which is the *master agreement* for *securities lending* transactions published by ISLA. The latest version of the GMSLA was published in 2010, and superseded the 2000 version, which superseded master agreements such as OSLA. See www.isla.co.uk.

guaranteed delivery

A commitment sought by a buyer of a security that a seller is in possession of that security (and has not repoed or otherwise lent them out) and is therefore certain of his ability to deliver.

haircut

An agreed percentage discount applied to the *Market Value* of *collateral* to fix the *Purchase Price* on the *Purchase Date* of a *repo*. A haircut is expressed as the

percentage difference between the initial Market Value and the Purchase Price. See Guide 3.3.

$$\text{Haircut} = \left(\frac{\text{Market Value of collateral} - \text{Purchase Price}}{\text{Market Value of collateral}} \right) \times 100$$

High-Quality Assets (HQA)

A type of *collateral* in a categorisation by the BIS Committee on the Global Financial System (CGFS). HQA is the second of three categories and comprises assets that market participants can use to meet collateral demand from derivatives transactions. The other categories are *Collateral Assets (CA)* and *High Quality Liquid Assets (HQLA)*.

High-Quality Liquid Assets (HQLA)

A type of *collateral* in a categorisation by the BIS Committee on the Global Financial System (CGFS). HQLA is the narrowest of three categories and follows the Basel Committee on Banking Supervision in including assets eligible for the Level 1 and Level 2 definitions of assets suitable for the Basel Liquidity Coverage Ratio (LCR). Assets that qualify for the LCR are expected to have low credit and market risk and be easy to value, exchange-listed, traded in active markets, unencumbered, liquid during times of stress and ideally central bank-eligible. The other categories are *Collateral Assets (CA)* and *High Quality Assets (HQA)*. Demand for HQLA is the primary driver of *collateral transformation*.

hold-in-custody (HIC)

A *repo* in which the *Seller* retains control and possession of the *collateral* even though legal title has passed to the *Buyer*. HIC repos are used where there are practical difficulties or high costs in moving collateral. However, a HIC repo exposes the Buyer to the risk of ‘double-dipping’ by the Seller, that is, the Seller selling the same piece of collateral in more than one repo. In some jurisdictions, the transfer of title to a security may require delivery. And HIC repos are not covered by the EU Financial Collateral Directive, while the EU Securities Financing Transaction Regulation (SFTR) makes the delivery of collateral a regulatory condition for its re-use. Cf *delivery repo* and *tri-party repo*.

ICMA

The acronym for the ‘International Capital Market Association’, which represents financial institutions active in the international capital markets worldwide and has members in over 50 countries. ICMA’s market standards and conventions have been pillars of the international debt market for over 50 years, providing the framework of rules governing market practice which facilitate the orderly functioning of the market.

ICSD

The acronym for an ‘International Central Securities Depository’. An ICSD is a specialised international bank, part of the market infrastructure, to which international securities (traditional eurobonds) are issued; which provides accounts for holders of these and many domestic securities; and which records changes in holdings by means of entries between these accounts. As they are banks, ICSD provide cash accounts to members and can therefore offer DVP

settlement of securities transactions. They also provide *tri-party* services. Cf *CSD*.

Income

In the *GMRA*, coupons, dividends and other non-capital payments made by the issuer of a collateral security.

initial margin

An agreed premium applied to the *Purchase Price* of a repo to determine the required *Market Value* of the *collateral* to be delivered on the *Purchase Date*. It is also applied each day during the term of a repo, as part of the process of *Margin Maintenance*, to the *Repurchase Price* on that day to calculate the Market Value of collateral required subsequently in order to maintain adequate collateralisation. Under the *GMRA*, if there is a material difference between (1) the Repurchase Price of a repo plus any initial margin and (2) the current Market Value of collateral, that repo has a *Transaction Exposure*. This will go into the calculation of *Net Exposure*, which determines if either party has the right to call for Margin Maintenance. An initial margin can be expressed either as (1) the Market Value as a percentage of the Purchase Price or (2) a ratio of the two amounts. In the *GMRA*, an initial margin is called a *Margin Ratio* and is defined as a ratio but the market tends to quote a percentage. A percentage initial margin of 100% or ratio of one means there is no initial margin. See Guide 3.2.

$$\text{initial margin (percentage)} = \left(\frac{\text{Market Value of collateral}}{\text{Purchase Price}} \right) 100$$

$$\text{initial margin (ratio)} = \left(\frac{\text{Market Value of collateral}}{\text{Purchase Price}} \right)$$

ISLA

The acronym for the ‘International Securities Lending Association’, a trade association established in 1989 to represent the common interests of participants in the European securities lending market. ISLA publishes the Global Master Securities Lending Agreement (*GMSLA*). See www.isla.co.uk.

liquidity swap

Another term for a *collateral swap*.

manufactured payment

A term common in the UK for a contractual payment in a *Repurchase Transaction* made by the *Buyer* to the *Seller*, which is triggered by the payment of a coupon, dividend or other income on *collateral* by the issuer to the Buyer (the issuer pays the Buyer because the Buyer has the legal title to the collateral during the term of the repo). A manufactured payment compensates the Seller for the risk he continues to take on the collateral as a result of his commitment to repurchase at a fixed or calculable price. The manufactured payment should be made on the same day as and be equal in value to the income payment. In a *Buy/Sell-Back*, there is no manufactured payment. Instead, the value of the income payment is deducted from the *Repurchase Price* due on the *Repurchase Date* together with an amount of interest to compensate for the delay in compensating the Seller. See Guide 4.6-4.11.

Margin Maintenance

Under the *GMRA*, the process of calling on a repo counterparty to provide *variation margin* (called *Margin Transfer* in the *GMRA*), either by making a cash payment (*Cash Margin*) or by delivering additional *collateral* (*Margin Securities*), in order to eliminate a *Net Exposure* in the portfolio of *repos* between two parties that have been documented under the same agreement. Alternatively, Margin Maintenance can be performed under the *GMRA* using the alternative mechanisms of *Repricing* or *Adjustment*, whereby transactions are terminated early and replaced by new transactions in which cash and collateral are brought back into line. The calculation of *Net Exposure* requires the marking-to-market of the collateral or, in the case of illiquid collateral, marking-to-model. See *GMRA* paragraph 4. See also Guide 3.

Margin Percentage

In the *GMRA* 2011, the term for a *haircut* applied to the *Market Value* of *Margin Securities*. See *GMRA* 2011 paragraph 2(aa). See also Guide 3.49.

Margin Ratio

In the *GMRA*, the term for an *initial margin*. See *GMRA* 2000 2(z) and *GMRA* 2011 paragraph 2(bb).

Margin Securities

Under the *GMRA*, securities provided as *variation margin* (called *Margin Transfer* in the *GMRA*).

Market Value

In the *GMRA*, the value of the *collateral* for the purposes of *Margin Maintenance*, calculated using 'a generally recognised source agreed to by the parties'. See *GMRA* 2000 paragraph 2(cc) and *GMRA* 2011 paragraph 2(ee).

master agreement

A written legal contract between two parties that sets out the terms and conditions governing all transactions between them (unless specifically excluded) in the same financial instrument (eg *repo*) or class of instrument (eg derivatives), as well as their rights and obligations, including remedies available in an *Event of Default*. The *GMRA* was designed to provide a standard master agreement under English law for cross-border repos but is also used in many domestic repo markets. It consists of:

- the main agreement, which sets out a framework of terms and conditions generic to the market in short-term *Repurchase Transactions* in government securities;
- Annex I, which sets out terms and conditions specific to the business relationship between two parties, consisting of various standard elections that are required by the main agreement and any supplemental terms and conditions that the parties agree to add to customize the main agreement;
- other annexes, which are sets of standardized amendments to the main agreement to incorporate *Buy/Sell-Backs*, equity collateral, *agency repos* and repo business in some specific markets and jurisdictions; and

- *Confirmations*, which set out the terms and conditions specific to individual transactions.

A master agreement reduces credit risk by setting out clearly the contractual terms and conditions accepted by the parties in order to provide legal certainty; standardises operational procedures, which reduces operational risk and cost; and further facilitates risk reduction by providing procedures such as *Margin Maintenance*, the *technical netting* of opposite payments and transfers, and, in an Event of Default, *close-out netting* procedures. Up-to-date master agreements are a requirement for the reduction of regulatory risk capital. The ICMA keeps the GMRA up to date by commissioning legal opinions on the enforceability of the GMRA in over 60 jurisdictions.

mini close-out

An informal term for the remedy available to the *Seller*, under the *GMRA*, in the event that there is a *failure to deliver* by the *Buyer* on the *Repurchase Date*. The undelivered *collateral* is valued using the default valuation methodology rather than at the *Market Value* that is used for *Margin Maintenance*. The Seller will receive the difference, on the termination date, between the Default Market Value and the *Repurchase Price* of the failed repo (how much is owed by the Seller). This contrasts with the *buy-in* procedure used in the cash market, in which the aim is to acquire the missing security for the Seller. See GMRA 2000 paragraph 10(h) and GMRA 2011 paragraph 10(i). See also Guide 4.2-4.5 and Annex IV.

minimum transfer amount

A common alternative term in the *repo* market for an *exposure threshold*. This term emphasises the point that, when *Net Exposure* reaches or breaches the exposure threshold, it should be completely eliminated. See Guide 3.40-3.44.

Modified Following Business Day Convention

This is the rule that is most commonly applied in the foreign exchange and money markets, including the repo market, to determine the maturity date of an instrument. The convention is that, for terms to maturity which are multiples of one month, the maturity date will fall in the month which is the same number of calendar months after the month in which the value date falls. For example, if the value date of a 3-month transaction is in March, then the maturity date will fall three calendar months later, which means in June. Furthermore, the maturity date will be the same date as the value date, unless this date is not a *Business Day*, in which case, it will be the next Business Day in the same calendar month. However, if the next Business Day would fall in the following calendar month, the maturity date will be the last Business Day in the same calendar month. For example, if the value date of a 3-month transaction is 29 March, the normal maturity date would be 29 June. If, however, the 29 June is not a Business Day, then the maturity date would be 30 June. If 30 June is also not a Business Day, then the maturity date would be 28 June and so on. See also the *End/End rule*. See Guide 2.8-2.25.

Net Exposure

In the *GMRA*, the term for an uncollateralised credit exposure (taking account of any initial margins and haircuts) of one party to another on a portfolio of *repos* documented under the same agreement. Specifically, the Net Exposure is the difference between:

- the aggregate of the *Transaction Exposures* of party A to party B, plus any unpaid manufactured payments due to party A, less the *Net Margin*, if that is held by party A; and
- the aggregate of the *Transaction Exposures* of party B to party A, plus any unpaid manufactured payments due to party B, less the *Net Margin*, if that is held by party B.

If (1) is greater than (2), the first party has a Net Exposure and may call for *Margin Maintenance*. See paragraphs 2(dd) and 4(c) of the *GMRA 2000* and paragraphs 2(ff) and 4(c) of the *GMRA 2011*.

Net Margin

The difference between the amount of previous *Margin Transfers* still held by one party and the amount still held by the other party. See *GMRA 4*.

netting

The process of aggregating mutual obligations between two parties to calculate a net obligation. See *close-out netting* and *technical netting*.

nominal value

The principal amount of a holding of a fixed-income security that is due to be paid to the holder at its maturity. Also known as ‘face value’, ‘par value’ and ‘redemption value’.

one week

The term from and including the value date of a transaction up to but excluding a maturity date seven days later or, if that day is not a *Business Day*, the next *Business Day* thereafter. If the next *Business Day* is in the next calendar month, it still becomes the maturity date. In other words, the following business day convention applies, not the *Modified Following Business Day Convention*.

open repo

A transaction which is terminable on demand by either party and therefore has no *Repurchase Date* and *Repurchase Price* until notice is given of termination. Under the terms of such a transaction:

- Both parties have an option to terminate the transaction on any *Business Day*, subject only to an agreed termination notice period. In the case of a standard open repo, this is no more than the conventional non-forward settlement period, ie T+0, T+1 or T+2. In the evergreen type of open repo, it is a longer agreed period.
- Both parties have the right to request a change (re-rate) in the repo rate on (1) any *Business Day* until the transaction is terminated or (2) any *Business Day* within an agreed period during the life of the transaction or (3) at any of an agreed series of dates, subject only to an agreed re-rate notice period. This notice period is usually the same as the termination notice period but does not need to be. If the other party refuses the request or agreement cannot be reached on a new rate, either party can terminate the transaction. It is possible for the repo rate on an open repo to be linked to

an *overnight*, *tom/next* or *spot/next* interest rate index, which means it would change automatically each Business Day.

- *Repo interest* is accrued daily without compounding. Interest can be paid on (1) the *Repurchase Date*, if the transaction is terminated, or (2) an agreed number of days after the last Business Day of each calendar month, while the transaction continues, or (3) on dates when the repo rate is changed. See Guide 2.20-2.25 and 2.98~~86~~-2.101~~89~~.

overnight (O/N)

The term from and including today up to but excluding the next *Business Day* or, if that day is not a Business Day, the next Business Day thereafter. If the next Business Day is in the next calendar month, it still becomes the maturity date. In other words, the following business day convention applies, not *the Modified Following Business Day Convention*.

overnight indices (OI)

In many currencies, an interest rate index is calculated and published daily for actual overnight wholesale funding over the entire course of the *Business Day* by:

- all banks obliged to report to the central bank (eg the Bank of England's reformed SONIA); or
- a selected panel of banks (eg ~~EONIA~~€STR); or
- bank clients of *voice-brokers* (the original Fed funds Effective Rate);

OI are weighted-average rates, where each rate is weighted by the total amount of deposits transacted at that rate. Traditionally, OI were unsecured interbank deposit rates. However, they can be secured (eg the SNB's SARON rate). They can be rates on transactions which are both interbank and also between banks and other wholesale market participants (eg the ECB's ESTER). They can also include the cost to banks of borrowing by issuing securities into the wholesale money market (eg reformed SONIA).

Because OI are based on transactions across the whole Business Day, they are published after the close of business.

In addition to OI, there are tom/next (TN) indices that are similar to OI in measuring the cost of one-day funds to banks except for the later value date.

The current OI for euro-denominated interbank overnight deposits is called ~~EONIA~~€STR (Euro Overnight Index Average). ~~EONIA~~€STR is the volume-weighted average of the rates on all unsecured deposits borrowed in the interbank market in euros by the EURIBOR panel of banks. It is fixed by the ECB between 6:45pm and 7:00pm CET on each *TARGET2* business day. The precise specification for ~~EONIA~~€STR is available on www.emmi-benchmarks.eu. The ECB plans to replace ~~EONIA~~€STR with ESTER, which is the weighted average cost to banks' borrowing euros in the wholesale money market, in 2020.

pair-off

This is the action of *netting* instructions to and from another party for opposite payments of cash or opposite deliveries of securities. Pair-offs are agreed

between the parties case by case. The payments being paired off must be in the same currency and due on the same date. The deliveries being paired off must be of the same security held at the same custodian or CSD. The aim of pair-offs is to eliminate or reduce operational cost and risk. Pair-offs are not legally binding so do not reduce credit risk. Pair-offs are therefore a type of *technical netting*. Pair-offs are particularly helpful when rolling over a transaction. See Guide 2.103~~94~~-2.107~~95~~.

partialling

The practice of not rejecting delivery of less than the contracted amount of a security purchased in a *cash trade or repo*. However, a partial delivery does not satisfy the contractual obligation of the seller. It just reduces the adverse economic impact of a failure to deliver the full amount. The seller remains obliged to complete full delivery. Partialling should not be confused with *shaping*, which is an operational mechanism by which a large delivery of securities is broken up into smaller deliveries by the seller or his agent. Like partialling, shaping is intended to reduce the economic impact of a failure to deliver. The difference is that partialling is a decision by a buyer and shaping is an action by a seller, ~~or~~ its agent or a market infrastructure such as a securities settlement system or CCP. See Guide 2.69~~3~~-2.76~~6~~.

pledge

A type of *security interest* which is a property interest in an asset, given by a cash borrower (pledgor) to a lender (pledgee or secured lender) to secure a debt. This interest gives the secured lender the right to seize and dispose of the asset in the event that the borrower defaults. Until then, the borrower retains ownership of the asset, which means that the asset cannot be sold by the secured lender, unless the borrower has given him a right of *re-hypothecation*. Upon the discharge of the debt by the borrower, the secured lender must return the original asset (not the *equivalent*). Sometimes called a 'pawn'.

Purchase Date

In the *GMRA*, the term for the value date of a *repo*. See Guide 2.8.

Purchase Price

In the *GMRA*, the term for the sum of money paid by the *Buyer* to the *Seller* on the *Purchase Date* of a *repo*. It is equal to the initial *Market Value* of the collateral less any *haircut or initial margin* (called *Margin Ratio* in the *GMRA*). See Guide 2.6.

regular dates or round dates or fixed dates

Terms to maturity of one week, two weeks, three weeks, one month, two months, three months, four months, five months, six months, seven months, eight months, nine months, 10 months, 11 months and one year, or some subset (a minimum definition would include only one week, one month, three months, six months and one year). These dates derived from 'brokers' runs', which were the terms for which *voice-brokers* would automatically provide quotes when asked for an indication of prices in the inter-bank forward foreign exchange or deposit markets. See Guide 2.8-2.25.

re-hypothecation

The right which a pledgor can give to a pledgee to sell or *repo* pledged assets to a third party. Without this right, the pledgee can only dispose of pledged assets in an *Event of Default* by the pledgor and usually only after its claim has been validated by an insolvency court. If the pledgee exercises a right of re-hypothecation, the pledgor's right to recover the pledged asset is replaced by an unsecured contractual right to receive an *equivalent* asset. Re-hypothecation is typically given by hedge funds to their prime brokers in return for cheaper funding. It is not relevant to *repos* based on the transfer of legal title. In this case, the *Buyer* has an automatic right to re-use the collateral since it is his property.

repo

The generic term for *Repurchase Transactions* and *Buy/Sell-Backs*. Repos (along with securities lending) are a type of *securities financing transaction (SFT)*. In a repo, at the start of the transaction (the *Purchase Date*), one party (the *Seller*) sells assets (the *collateral*, typically securities) to another party (the *Buyer*) at one price (the *Purchase Price*) and commits to repurchase the same quantity of assets which are *equivalent* to those sold at a future date or on demand (the *Repurchase Date*) at an agreed or calculable price (the *Repurchase Price*). The *Buyer's* side of a repo is often called a *reverse repo*.

repo interest

The market term for the return to the *Buyer* on the cash he effectively lends through a *reverse repo*. Legally-speaking, however, the term is a misnomer, as the legal form of a repo is not an interest-paying loan or deposit. Rather, the return is just the difference between two securities prices. In the *GMRA*, repo interest is called the Pricing Differential.

repo rate

The market term for the annualised percentage rate of interest on the cash in a *repo*. Legally-speaking, however, the term is a misnomer, as the legal form of a repo is not an interest-paying loan or deposit. Rather, the return is just the difference between two securities prices. In the *GMRA*, the repo rate is called the Pricing Rate. Traditionally, the repo rate was the price of a *Repurchase Transaction* but *Buy/Sell-Backs* are now often quoted in the same way. See Guide 2.4.

Repricing

In the *GMRA*, an alternative mechanism for *Margin Maintenance* to *variation margin* (called *Market Transfer* in the *GMRA*) as a means of eliminating a *Net Exposure*. Repricing accelerates the *Repurchase Date* of a *repo*, which effectively terminates it, and replaces it with a new so-called Repriced Transaction for the same date. The Repriced Transaction will have a new *Purchase Price* that is calculated by applying the market price of the *collateral* on the so-called Repricing Date to the original *nominal value* plus any agreed *haircut* or *initial margin* (called *Margin Ratio* in the *GMRA*) to calculate a new *Market Value*.

$$\text{new Purchase Price} = \frac{\text{new Market Value}}{\text{Margin Ratio}}$$

or

new Purchase Price= new Market Value (1 - haircut)

The new Purchase Price is the cash amount which the *Buyer* is obliged to pay to the *Seller* in the Repriced Transaction. In other words, the Purchase Price is brought into line with the latest Market Value of the collateral. The nominal amount of collateral does not change. As payments should be netted where possible, only the difference between the Repurchase Price of the original repo on the Repricing Date and the Purchase Price of the Repriced Transaction should actually have to be paid. This difference is equal to (1) the change in the Market Value of the collateral plus (2) the repo interest accrued to the Buyer up to the Repricing Date. So, in respect of the change in the Market Value of the collateral, Repricing produces what is, in effect, a cash *variation margin* (called a *Margin Transfer* in the GMRA).

Repricing was designed for *Buy/Sell-Backs* but can be applied to *Repurchase Transactions*. The related method of *Adjustment* involves changing the Market Value of the collateral rather than the Purchase Price. 'Repricing' is commonly but incorrectly used in the market as a generic term to describe both *Adjustment* and the above method. See GMRA 2000 paragraph 4(j) and GMRA 2011 paragraph 4(k). See also Guide 3.55-3.58.

Repurchase Transaction

Also known as a *classic repo*, US-style repo or all-in repo. In some countries, there are also domestic names for this type of repo. A Repurchase Transaction is a type of repo which is documented under a *master agreement*, in consequence of which, both legs of the transaction are part of a single contract. Among other things, a master agreement makes provision for: *haircuts* and/or *initial margins* at the start of a repo; *Margin Maintenance* during the term of a repo to eliminate or reduce material uncollateralized exposures; the ability of the *Buyer* to grant *permission to substitute collateral* to the *Seller* without terminating and replacing the transaction; the immediate making of a *manufactured payment* to the *Seller* upon the payment of a coupon, dividend or other income on the collateral during the term of a transaction; and *close-out* netting in an *Event of Default* by either party. Cf *Buy/Sell-Back*.

Repurchase Date

In the *GMRA*, the term for the maturity date of a *repo*. See Guide 2.10.

Repurchase Price

In the *GMRA*, the term for the sum of money to be paid by the *Seller* of a repo to the *Buyer* on the *Repurchase Date* to buy back *equivalent collateral*. It is equal to the *Purchase Price* plus *repo interest*. This term also applies to the value of the cash owed to the *Buyer* on any day during the term of a *repo*, that is, the *Purchase Price* plus repo interest accrued up to that particular date. In the case of *Buy/Sell-Backs*, the *Repurchase Price* is net of the amount of any coupon, dividend or other income on the *collateral* paid to the Buyer during the life of

the transaction plus reinvestment income to compensate for the delayed payment.

re-rate

Market terminology for re-fixing the *repo rate* on an *open repo*.

reverse repo

The *Buyer's* side of a *repo*. The *Buyer* is said to 'reverse in' *collateral* (whereas the *Seller* is said to 'repo out' *collateral*).

securities financing transaction (SFT)

The family of financial instruments in which a security is provided against a payment of cash. SFT include *repo*, *securities lending*, commodities lending and margin lending but not the collateralisation of derivatives or lending against a security interest.

security interest

An umbrella term for a property interest in an asset, given by a cash borrower to a lender to secure a debt. This interest gives the secured lender the right to dispose of the asset in the event that the borrower defaults but only usually after its claim has been validated by an insolvency court. During the secured loan, the borrower retains a property interest in the asset, which means that, absent a default by the borrower, the asset cannot be disposed of by the secured lender, unless the borrower has given him a right of *re-hypothecation*. Upon the discharge of the debt by the borrower, the secured lender must return the same asset (not an equivalent). A common type of security interest is a *pledge*. Others include charges, liens and mortgages.

securities lending

Securities loans are a type of *securities financing transaction (SFT)*. In a securities loan, one party (the Lender) transfers title to a security or basket of securities to another party (the Borrower) usually in exchange for *collateral* in the form of either (1) title to another security or basket of securities or (2) cash and commits to either (1) transfer title to *equivalent collateral* or (2) repay cash plus agreed interest at a future date or on demand, plus a fee for the loan, in exchange for title to a security or basket of securities equivalent to the one it transferred at the start. Despite securities lending counterparties being called Lenders and Borrowers, title to securities is transferred (at least outside the US), as in *repo*. However, it is possible for the collateral to be pledged instead of using title transfer.

Securities lending transactions and repos are analogous instruments in legal and economic terms. The main differences are that: securities lending does not necessarily involve cash (it can be security against security); is more often than repo driven by the demand to borrow specific securities (rather than cash); and often involves equity and, as a result of the corporate actions and votes that characterise equity, tends to be transacted on an open basis in order to allow the original holder to retrieve the security or securities in order to be able to exercise those rights. The standard master agreement for securities lending is the *ISLA GMSLA*.

Sell/Buy-Back

Another term for a *Buy/Sell-Back*. Strictly-speaking, this is a *Buy/Sell-Back* from the point of view of the *Seller*. Sometimes abbreviated to 'sell/buy'.

Seller

In the *GMRA*, the party to a *repo* who sells *collateral* for cash in the form of the *Purchase Price* on the *Purchase Date* and commits to buy back the same quantity of *equivalent collateral* on the *Repurchase Date* --- which will be a fixed maturity date or, in the case of *open repo*, on demand --- at an agreed or calculable *Repurchase Price*. The Seller is effectively borrowing cash. Cf *Buyer*.

set-off

A classic legal technique for reducing the size of mutual obligations between two parties. One party's obligations to another are extinguished to the extent of the other party's mutual obligations to the first party. Set-off is traditionally limited to due and payable obligations between solvent parties. Set-off is often distinguished from *netting* but has a similar effect and is frequently used as a basis for introducing *close-out netting* into law.

shaping

The operational practice of dividing a large delivery of securities into smaller deliveries before instructing a securities settlement system (SSS). The aim is to minimise the economic impact of any settlement failure. Some SSS and CCP automatically shape deliveries. A standard 'shape' in the European repo market is currently 50 million. Shaping should not be confused with *partialling*, where the buyer waives his contractual right to refuse an incomplete delivery. Like shaping, *partialling* is intended to reduce the economic impact of a failure to deliver. The difference is that shaping is an action by a seller or its agent, whereas *partialling* is a decision by a buyer. See Guide 2.6⁹³.

short dates

Terms to maturity of one month or less.

short-selling

A sale in a *cash trade* of securities that are not owned by the seller. The seller should borrow the securities in order to be able to fulfil his commitment to deliver those securities to the buyer (without offsetting the sale by buying). He can borrow securities in the *repo* or *securities lending* markets. The short-seller will have to purchase the securities at a later date in order to return to the *Seller/lender* in the repo or securities lending transaction. In the meantime, he will be exposed to the risk of a theoretically unlimited rise in the price of the security, as well as any positive *cost of carry* and the risk that it may not, in practice, be possible to buy the security because of market illiquidity or competing demand. Short positions may be established in order to profit from over-valuation, to hedge long positions in similar securities or related derivatives, or to arbitrage against the mispricing of similar securities. Short-selling with no intention of delivering is called 'naked short-selling' and represents market abuse. In the EU, the Short Selling Regulation, among other things, requires short-sellers of EU government securities and equities trading on an EU venue to borrow before selling, to make an arrangement to borrow after selling or to locate a borrowing source which is reasonably certain.

special collateral	<i>Collateral</i> on which the <i>repo rate</i> is materially below the <i>GC repo rate</i> for the same term. This differential is caused by the demand for a particular piece of collateral which is manifest in offers of cheap cash from potential <i>Buyers</i> in the <i>repo</i> market. Cf <i>GC repo</i> .
spot-next (S/N)	The term from and including the spot value date up to but excluding the next <i>Business Day</i> or, if that day is not a <i>Business Day</i> , the next <i>Business Day</i> thereafter. If the next <i>Business Day</i> is in the next calendar month, it still becomes the maturity. In other words, a following business day convention applies, not <i>the Modified Following Business Day Convention</i> .
substitution of collateral	The ability that may be given by the <i>Buyer</i> to the <i>Seller</i> , usually agreed in advance, during the negotiation of a <i>repo</i> , to recall <i>collateral</i> during the term of that transaction and substitute collateral of equal quality and value that is reasonably acceptable to the <i>Buyer</i> . Permission can also be given to substitute <i>Margin Securities</i> . The <i>GMRA</i> envisages substitution as a modification of the terms of a contract rather than the replacement of the contract with a new one. See <i>GMRA</i> paragraph 8. However, in some jurisdictions or for operational reasons, it may not be possible to modify the terms of a <i>repo</i> to implement the substitution of collateral. In these cases, substitution can be effected by early termination of a contract and its replacement with a new contract against different collateral. See Guide 2.29-2.31 and 4.19-4.23.
synthetic repo	A combination of instruments to replicate the risk/return profile of a <i>repo</i> . A synthetic repo is constructed from a <i>cash trade</i> in a security and a total return swap or a futures contract or a combination of options. The derivative(s) replace the repurchase leg of a <i>repo</i> by performing the function of transferring the risk and return on the security back to the <i>Seller</i> . As in a normal <i>repo</i> , during the transaction, one party has the use of cash and the other has the use of the security. At the end of a synthetic <i>repo</i> , the parties usually agree to sell the security back to the original holder at the current price.
TARGET 2	The acronym for the Trans European Automated Real Time Gross Settlement Express Transfer system. This is a real-time gross settlement system operated by the ECB for large-value cash payments in euros between the national central banks of the eurozone. It is used to settle the money market operations of the ECB and large-value payments between the domestic payments systems of the eurozone. It was upgraded to TARGET2 (T2) in 2007.
T2S	The acronym for TARGET 2 Securities. This is the real-time gross securities settlement system for euro-denominated securities and securities in some other currencies operated by the ECB. It connects <i>CSD</i> , <i>ICSD</i> and custodian banks, as well as investors who wish to be connected directly. T2S is connected to T2, to allow <i>DVP</i> settlement in central bank money.
technical netting	Another term for ‘operational netting’ or ‘payments netting’. Technical netting is the offsetting of opposite payments in the same currency due on the same day between the same two parties and the offsetting of opposite deliveries of

the same security held at the same custodian or CSD that are due on the same day between the same parties. The purpose is to reduce operational cost and risk. Technical netting is not legally binding so does not reduce credit risk like *close-out netting*. *Pair-offs* are an example of technical netting.

term repo

‘Term repo’ has a number of related meanings. It is commonly used in the market to describe transactions with a term to maturity beyond one Business Day but is sometimes applied to all fixed-term transactions (as opposed to *open repo*). However, in a legal context, ‘term repo’ is often used to describe *repo* with terms to maturity of one year or more. These longer-term repos are often used in *collateral swaps*. They are structured and floating-rate, and have deep *haircuts* and enhanced ‘rights’ of *substitution*.

terminable on demand

Of an *open repo*, in which either party has the right to terminate the transaction by providing due notice.

tom-next (T/N)

The term to maturity from and including the next Business Day up to but excluding the following *Business Day* or, if that day is not a *Business Day*, the next Business Day thereafter. If the next Business Day is in the next calendar month, it still becomes the maturity date. In other words, the Following Business Day convention applies, not the *Modified Following Business Day Convention*.

trade matching

The comparison of settlement instructions from two parties to a transaction by a *custodian* bank acting as securities settlement agent for one or both, or by a CSD or ICSD, in order to ensure that the settlement of that transaction across a securities settlement system at the CSD or ICSD will not fail because of differences in the instructions from the two parties. Trade matching is different from *affirmation* and *Confirmation*, which should take place as soon as possible after the execution of a transaction at the start of the post-trade process and are intended to verify the terms and conditions of the transaction, whereas trade matching takes place just before settlement near the end of the post-trade process and is narrower in scope than affirmation and Confirmation as it only verifies the information needed for settlement.

trade repository

A specialised institution, part of the infrastructure of the over-the-counter (OTC) market, to which market users report the details of their transactions in a particular instrument or class of instruments, and/or the resulting positions, typically to satisfy regulatory requirements (eg the EU Securities Financing Transaction Regulation or SFTR). The repository validates, matches and stores these data and provides access to supervisors and certain other official agencies to assist the regulation of individual firms, the supervision of markets and the monitoring of systemic risk. The repository may also publish aggregated statistics in order to enhance market transparency for users.

Transaction Exposure

In the *GMRA*, this is the difference between the *Repurchase Price* (adjusted by any *initial margin*) on the date of the calculation and the *Market Value* of the collateral (adjusted by any *haircut*) on the same day. In other words, Transaction Exposure measures the current uncollateralized credit exposure of one party to another on an individual *repo*. See *GMRA 2000* paragraph 2(ww) and *GMRA 2011* paragraph 2(xx).

transfer of title

The transfer of the full property rights to an asset from one party to another. The result is that the new owner has the unfettered right to do what he wishes with the asset and the right to receive any and all benefits of ownership (eg coupons). In *repo*, transfer of title takes place through a true sale of the asset. Cf *security interest*.

tri-party repo

A *Repurchase Transaction* in which a third-party agent (who is the *custodian* bank or *CSD* for both parties) undertakes the settlement, custody and post-trade management of the transaction. Settlement is made by book-entry transfers between accounts on the books of the agent and so avoids the cost of settling across a *securities settlement system* but ensures a change of control and possession. The services of tri-party agents include the automatic selection of *collateral* from the account of the *Seller*, subject to the collateral eligibility criteria, concentration limits and *haircuts* or *initial margins* pre-defined by the *Buyer*; variation margining; management of *manufactured payments*; and the 'optimisation' of collateral. The most common type of optimisation is ensuring that the collateral held by the Buyer is always of the lowest quality acceptable to the Buyer (this means the Seller is making the most efficient use of his collateral, while the Buyer is earning the highest return). Optimisation is achieved by substituting existing collateral with new collateral whenever the Seller purchases a security of lower but still acceptable quality. The tri-party agent will also substitute when the Seller wishes to sell a security that has been repoed out as collateral, or when collateral is no longer acceptable to the Buyer (eg because of a ratings downgrade) or when collateral is due to make a coupon, dividend or other income payment that might cause tax problems or when there is a corporate action.

Because the collateral is selected by the agent, tri-party repo can only be used for funding and not for borrowing or lending specific securities. In other words, tri-party repo is *GC repo*.

Tri-party repos are governed by a combination of a bilateral *master agreement* plus terms and conditions agreed with the tri-party agent.

Cf *delivery repo* and *HIC repo*.

two weeks

The term from and including the value date of a transaction up to but excluding a maturity date 14 days later or, if that day is not a *Business Day*, the next Business Day thereafter. If the next Business Day is in the next calendar month, it still

becomes the maturity date. In other words, a following business day convention applies, not *the Modified Following Business Day Convention*.

three weeks

The term from and including the value date of a transaction up to but excluding a maturity date 21 days later or, if that day is not a *Business Day*, the next Business Day thereafter. If the next Business Day is in the next calendar month, it still becomes the maturity date. In other words, a following business day convention applies, not *the Modified Following Business Day Convention*.

variation margin

The term often applied to a cash payment or delivery of collateral made by one party, in response to a call by the other to eliminate a material uncollateralized credit exposure between them. Called a *Margin Transfer* in the GMRA. Margin Transfers can be made in *Cash Margin* or *Margin Securities* or both. Under the GMRA, either party is entitled to call for a Margin Transfer to eliminate a *Net Exposure*. Instead of a Margin Transfer, it is also possible under the GMRA to trigger the alternative mechanisms of *Repricing* or *Adjustment*. Margin Transfers and the alternative mechanisms are part of the process known in the GMRA as *Margin Maintenance*. See GMRA 4 and also Guide 3.

voice-broker

An agent who matches parties, typically financial intermediaries, who wish to transact financial instruments. The voice-broker collects prices from customers willing to quote and broadcasts the best bid price and the best offer price back and an indication of amounts to all his customers, without revealing who is quoting these prices (pre-trade anonymity). When genuine interest is expressed in one of these quotes, the voice-broker puts the party expressing interest in touch with the party quoting ('name give-up') and, if they are acceptable names to each other, the two parties settle the transaction between themselves. The voice-broker is not a principal intermediary in the transaction and earns a commission rather than a bid/offer spread. Although voice-brokers originally broadcast prices over dedicated loudspeaker systems installed in customers' offices, they now tend to broadcast prices on dedicated screens carried by market information vendors. Voice-brokers are a significant but declining part of the repo market in Europe.

Annex III - What are open, evergreen and extendible repos?

Definitions

1. The following definitions give the meanings of the terms “open”, “evergreen” and “extendible” as generally understood in the European repo market. They describe the commonest forms of these transactions currently in use but parties may agree different contractual terms and conditions, for example, on notice periods and interest payment dates, particularly for customers.

Open repo

- 1.1 An open repo is a transaction which is agreed without a repurchase date but which is terminable on demand by either party.
 - **Exercise of option to terminate.** Both parties have an option to terminate the transaction on any business day, subject only to a minimum termination notice period. In standard open repo, the notice period is no more than the conventional or mandatory collateral settlement period (typically T+0, T+1 or T+2). In the open type of evergreen repo (see below), the minimum termination notice period is much longer.
 - **Repo rate.**
 - It is common for the repo rate on an open repo to be changed up or down (“re-rated”) only at the request of one or other of the parties and only with the agreement of the other.
 - Alternatively, the repo rate on an open repo can be linked to a one-day interest rate index (eg ~~EONIA~~ €STR), which means it would change automatically each business day.
 - If the repo rate is a floating-index plus/minus a spread, either party can request a change to the spread.
 - Both parties typically have the right to request a re-rate on any business day until the transaction is terminated. An agreed re-rate will take place after a minimum re-rate notice period. This period is usually the same as the minimum termination notice period. If the other party refuses a request to re-rate or agreement cannot be reached on a new repo rate, either party can terminate the transaction. When an open repo is re-rated, either the transaction continues without interruption at the new repo rate or the transaction is terminated and replaced by a new transaction at the new repo rate (the choice depends on operational convenience).
 - **Payment of interest.** Repo interest is accrued daily without compounding. Accrued repo interest can be paid, as agreed:
 - on the repurchase date following the termination of a transaction as part of the repurchase price; or
 - on the re-rate date as a discrete interest payment; or
 - a fixed number of days after the last business day of each calendar month while the transaction continues as a discrete interest payment.

Evergreen repo

1.2 An evergreen repo is either an open transaction or a transaction with a fixed repurchase date (fixed term) under which both parties have an option to terminate the transaction. The key characteristic of an evergreen repo is the extended minimum notice period for termination. This is intended to ensure that the repo provides funding for at least the required notice period. A common notice period is 31 days, which pushes the repurchase date beyond the horizon of the Liquidity Coverage Ratio (LCR).

- **Exercise of option to terminate.**
 - Termination can be, as agreed:
 - on any business day during the remaining term of the transaction --- this is the most common option; or
 - in the case of a fixed-term evergreen:
 - any business day during the remaining term of the transaction unless this is equal to or less than the minimum notice period (eg a one-year evergreen with a 30-day minimum notice period can be terminated up to 30 days before the end of the one-year term); or
 - at any of a series of dates.
 - It has been explained already that, characteristically, the right to terminate an evergreen repo is subject to a minimum termination notice period that is longer than the conventional or mandated settlement period.
- **Repo rate.**
 - The repo rate on an evergreen repo can be changed up or down (re-rated) only at the request of one or other of the parties and only with the agreement of the other.
 - Alternatively, the repo rate can be linked to a one-day interest rate index (eg ~~EURIBOR~~ €STR), which means it would change automatically each business day.
 - Or the repo rate can be linked to a term interest rate index (a tenor longer than one day), which means it would change automatically and periodically at the end of each successive interest rate period.
 - If the repo rate is a floating-index plus/minus a spread, either party can request a change to the spread.
 - Both parties typically have the right to request a re-rate on any business day until the transaction is terminated. An agreed re-rate will take place after a minimum re-rate notice period. This period is usually the same as the minimum termination notice period. If the other party refuses a request to re-rate or agreement cannot be reached on a new repo rate, either party can terminate the transaction. When an open repo is re-rated, either the transaction continues without interruption at the new repo rate or the transaction is terminated and replaced by a new transaction at the new repo rate (the choice depends on operational convenience).
- **Payment of interest.** As for an open repo.

- **Substitution of collateral.** The Seller can request to substitute collateral at any time. The exchange of securities would take place as agreed.

In a variant of the evergreen repo, the transaction has a repurchase date equal to the purchase date plus the minimum notice period. However, each day until the earlier of the repurchase date or the exercise of the option to extend, the repurchase date is automatically extended by one business day. This means the transaction can run for an indefinite period, like an open evergreen, but is actually a fixed-term extendible.

Extendible repo

1.3 An extendible repo is a fixed-term transaction under which one party will give the other an option to defer the repurchase date for an agreed further term. In some extendible contracts, the option is to defer the repurchase date and create a new extendible with the same terms as the previous.

- **Exercise of option to extend.** The parties can agree to extend the transaction, as agreed:
 - on any business day during the original term of the extendible; or
 - on any business day within a period during the original term of the extendible, either a period at:
 - the start of the original term of the extendible (eg during the first month of a 4-month extendible); or
 - the end of the original term of the extendible (eg during the last three months of a 4-month extendible); or
 - any of a series of dates during the original term of the extendible (eg at the end of each month of a 4-month extendible); or
 - at any time during the original term of the extendible.

Any extension is subject to an agreed period of notice.
- **Repo rate.** As for open repo.
- **Payment of interest.** Repo interest is paid on:
 - the original repurchase date, if the transaction is not extended; or
 - the final repurchase date, if the transaction is extended; or
 - in the case of an extendible repo on which the repo rate is linked to an interest rate index other than a 1-day index such as ~~EONIA~~ €STR, following a re-rate.
- **Substitution of collateral.** The Seller can request to substitute collateral:
 - at the same time as the parties agree to extend the transaction; or
 - as otherwise agreed.

The exchange of securities would usually take place as agreed.

Extendibles are described using three numbers, eg 4-3-4.

- The first number is the initial term of the repo given to the nearest number of round months (four months in the case of a 4-3-4). This is the minimum term of the repo.
- The second number gives the nearest number of round months in advance of the repurchase date which fixes the start of the period during which it can

be agreed to extend the transaction (this would be three months before the initial repurchase date in the case of a 4-3-4, so one month after the start of the repo).

- The third number is the nearest number of further round months for which a simple extendible repo can be extended after the extension date (three months after the extension date, which would be an extra one month beyond the original repurchase date, in the case of a 4-3-4 repo).

If the option in the example above was to defer the repurchase date and create a new extendible with the same terms, the exercise of the option one month after the start of the repo would create a new 4-3-4 extendible. This means that, after another month, the extension option could be exercised again.

Terminology

2. The following terms have been used in the preceding section. Parties are free to apply their own terminology but should take care to ensure that all terms are clearly understood by both parties.

Open and evergreen repo

- 2.1 **Termination date** --- the repurchase date fixed by the effective service of a termination notice by one of the parties
Termination notice date --- date on which one of the parties serves a termination notice
Termination notice period --- the number of business days before a termination notice takes effect
Re-rate --- an agreed change in the open repo rate.
Re-rate date --- the business day on which a *re-rate* takes effect
Re-rate notice date --- the date on which one of the parties serves a re-rate notice
Re-rate notice period --- the number of business days before a re-rate notice takes effect
Payment date --- a date on which repo interest is to be paid

Extendible repo

- 2.2 **Original term** --- the days until the *original repurchase date*
Original repurchase date --- the earliest repurchase date in the contract unless and until the transaction is extended
Interim repurchase date --- a previous repurchase date other than the *original repurchase date*, if the transaction has been extended
Current repurchase date --- the next repurchase date (this will be the *original repurchase date* unless and until the transaction is extended, or the newest repurchase date if the transaction has been extended)
Final repurchase date --- the last repurchase date once an extension option has not been exercised
Extended term --- the days added to the term of the by an *extension*
Extension --- a deferral of the *current repurchase date*
Extension date --- the first calendar day of an extended term
Extension option period --- the period during which an extension option can be exercised

Extension notice date --- the date on which one of the parties serves an extension notice

Extension notice period --- the number of business days before an extension notice takes effect

Re-rate --- an agreed change in the open repo rate

Re-rate notice date --- the date on which one of the parties serves a re-rate notice

Re-rate date --- the number of business days before a re-rate notice takes effect

Payment date --- a date on which repo interest is to be paid

repo rate				termination/extension		substitution	
can it be re-rated?	when can re-rate be requested (re-rate date)?	re-rate notice period	interest payment date	eligible dates	termination/extension notice period	notice date	substitution notice period
open repo	option 1.1 --- whenever requested by either party, if other agrees	any business day until termination or during a sub-period or on any of a series of agreed dates	option 3.1 --- repurchase date	any business day within term	conventional or mandatory settlement period	n/a	n/a
			option 3.2 --- after end of calendar month	option 4.1 --- any business day within term	as agreed but beyond conventional or mandatory settlement period	any business day within term	
evergreen	fixed-term		option 2.2 --- same as conventional or mandatory settlement period	option 4.2 --- any business day within agreed sub-term			as agreed
			option 3.3 --- on the re-rate date	option 4.3 --- on any one of a series of agreed business days			
extendible	option 1.2 --- floating rate index would be automatically updated but change in spread can be requested by either party, if other agrees	when parties agree to extend	when parties agree to extend	option 2.1 --- original repurchase date or, if extended, new repurchase date	option 3.1 --- any business day within term	option 4.1 --- when parties agree to extend	option 4.2 --- as otherwise agreed
				option 2.2 --- spread re-rate date	option 3.2 --- any business day within agreed sub-term	extension takes place on original repurchase date irrespective of how far in advance extension is agreed	
					option 3.3 --- on any one of a series of agreed business days		

Annex IV - Example of a mini close-out notice

Form of mini close-out notice to be served under paragraph 10(f)/(h)

To:
From:
Date:
Dear Sirs
**Subject: [PSA/ISMA Global Master Repurchase Agreement 1995]
[TBMA/ISMA Global Master Repurchase Agreement 2000]¹ dated _____
(the “Agreement”)
[Repurchase] [Buy/Sell]¹ Transaction (reference number: _____)
(the “Transaction”)
Seller:
Buyer:
Purchase Date:
Repurchase Date:
Purchased Date:
Purchased Securities (including ISIN):
Terms defined in the Agreement have the same meaning in this letter.
You have failed to deliver Equivalent Securities on the Repurchase Date for the Transaction.**

[Option A²

We hereby notify you that if you do not deliver Equivalent Securities by _____ we will serve notice on you under paragraph 10[(f)][(h)]³ (iii) of the Agreement terminating the Transaction in accordance with that paragraph.]

[Option B⁴

In accordance with paragraph 10[(f)][(h)]³(iii) of the Agreement, we hereby declare that the Transaction be terminated immediately in accordance with paragraph 10(c) of the Agreement.

We will determine the amount of the Repurchase Price and the Default Market Value of the Equivalent Securities in accordance with paragraph 10(c) as at the date on which this notice is given. For this purpose the Default Valuation Time is [_____]].

[For the avoidance of doubt, we are not treating the failure to deliver Equivalent Securities as an Event of Default under paragraph 10(a)(ii) of the Agreement and this notice does not constitute a Default Notice. This notice does not constitute a waiver of our right to serve a Default Notice in respect the failure to deliver Equivalent Securities.⁵]

We reserve all our right to exercise any other remedy under the Agreement including, without limitation, the right to serve a Default Notice in respect of any Event of Default that may occur under the Agreement.
Yours faithfully

¹ Delete as appropriate

² Option A: notice of intention to exercise rights under mini close-out

³ Delete as appropriate; sub-paragraph (f) for the GMRA 1995 and (h) for the GMRA 2000

⁴ Option B: notice terminating the transaction under mini close-out

⁵ Include only for GMRA 2000 where the parties have specified that paragraph 10(a)(ii) applies

Annex V - Forms of confirmation in Annex II of the GMRA

Form of Confirmation in Annex II of the GMRA 2000

Form of Confirmation

To:
From:
Date:
Subject: [Repurchase][Buy/Sell Back]* Transaction
(Reference Number:)

Dear Sirs,

The purpose of this [letter]/[facsimile]/[telex], a "Confirmation" for the purposes of the Agreement, is to set forth the terms and conditions of the above repurchase transaction entered into between us on the Contract Date referred to below.

This Confirmation supplements and forms part of, and is subject to, the Global Master Repurchase Agreement as entered into between us as of [] as the same may be amended from time to time (the "Agreement"). All provisions contained in the Agreement govern this Confirmation except as expressly modified below. Words and phrases defined in the Agreement and used in this Confirmation shall have the same meaning herein as in the Agreement.

1. Contract Date:
2. Purchased Securities [state type[s] and nominal value[s]]:
3. CUSIP, ISIN or other identifying number[s]:
4. Buyer:
5. Seller:
6. Purchase Date:
7. Purchase Price:
8. Contractual Currency:
- [9. Repurchase Date]:*
- [10. Terminable on demand]:*
11. Pricing Rate:
- [12. Sell Back Price]:*
13. Buyer's Bank Account[s] Details:
14. Seller's Bank Account[s] Details:
- [15. The Transaction is an Agency Transaction. [Name of Agent] is acting as agent for [name or identifier of Principal]]:*
- [16. Additional Terms]:*

Yours faithfully,

* Delete as appropriate

Form of Confirmation in Annex II of the GMRA 2011

Form of Confirmation

To:
From:
Date:
Subject: [Repurchase] [Buy/Sell Back]* Transaction
(Reference Number:)

Dear Sirs,

The purpose of this [letter] [facsimile], a “Confirmation” for the purposes of the Agreement, is to set forth the terms and conditions of the above repurchase transaction entered into between us on the Contract Date referred to below.

This Confirmation supplements and forms part of, and is subject to, the Global Master Repurchase Agreement as entered into between us as of [] as the same may be amended from time to time (the “Agreement”). All provisions contained in the Agreement govern this Confirmation except as expressly modified below. Words and phrases defined in the Agreement and used in this Confirmation shall have the same meaning herein as in the Agreement.

1. Contract Date:
2. Purchased Securities [state type[s] and nominal value[s]]:
3. CUSIP, ISIN or other identifying number[s]:
4. Buyer:
5. Seller:
6. Purchase Date:
7. Purchase Price:
8. Contractual Currency:
- [9. Repurchase Date]:*
- [10. Terminable on demand]:*
11. Pricing Rate:
- [12. Sell Back Price]:*
13. Buyer's Bank Account[s] Details:
14. Seller's Bank Account[s] Details:
- [15. The Transaction is an Agency Transaction. [Name of Agent] is acting as agent for [name or identifier of Principal]]:*
- [16. Additional Terms]:*

Yours faithfully,

* Delete as appropriate

Annex VI - The effect of negative interest on collateral value

Negative accrued interest is a term used to describe the effect on the market value of a fixed-income security of having an income record date that precedes the income payment date, that is, the effect of a so-called “ex-dividend period”. If a fixed-income security is being used as collateral in a repo, the advent of an ex-dividend period, other things being equal, will change the market value of the collateral and increase the transaction exposure of the buyer, which may trigger a variation margin call. Negative accrued interest can be a confusing topic and this Annex offers an explanation of the concept.

Negative accrued interest does not mean that coupon interest on a fixed-income security becomes a cost to the holder of the security after an income record date. It is an automatic adjustment to the market value of a fixed-income security after the advent of an ex-dividend period which corrects a problem created by the ex-dividend period.

On an income record date, the current holder of a fixed-income security is recognized by the issuer or their payment agent as the person to whom the next coupon should be paid (the “holder of record”). This means that if the holder of record were to sell the security during the ex-dividend period, on the income payment date, they would still receive the coupon, which would include accrued interest from the date they sold the security. From an economic point of view, that accrued interest should have gone to the buyer as the holder over that period. Obviously, no one would buy a security if they were not to receive accrued interest for the period over which they held the security. Accordingly, to restore the economics of the security, on an income record date, assuming no change in the clean price, the market value of the security will fall to reflect the loss of the coupon. The level to which the market value should fall will be the clean price less the coupon interest that is due to accrue over the ex-dividend period. The coupon interest that is due to accrue over the ex-dividend period is called negative accrued interest.

As negative accrued interest declines as the security approaches the next income payment date, assuming no change in the clean price, someone buying and selling during the ex-dividend period will buy at a lower market value and sell at a higher market value. This means that they will effectively earn accrued interest.

Negative accrued interest also means that the holder of record will not receive the coupon interest that has accrued up to the income record date and they will also lose the negative accrued interest outstanding on the date of sale. But they will receive the whole coupon on the income payment date. The difference between the coupon they receive and the negative accrued interest they lose is equal to the coupon interest accrued up to the date of sale, which is the amount of return that is economically justified.

So negative accrued interest can be seen as an automatic market mechanism that takes unearned coupon interest from the holder of record and pays it to the actual holder of a fixed-income security.

For example, consider a security pays a coupon of 1% on 15 January (which is therefore the income payment date) but goes ex-dividend on 8 January (which is therefore the income record date). In other words, there is a seven-day ex-dividend period. For simplicity, assume the security always trades at a clean price of par. On 8 January, the market value of the security will drop from 100.980822 to 99.980822 (assuming an A/A basis and no leap year). This is the assumed clean price of 100 less seven days of accrued interest at a coupon rate of 1% per annum.

If the holder of record sells 100 nominal of the security on 8 January, they will receive 99.980822. On 15 January, they will receive the coupon of 1.00. Ignoring the time value of money, the holder of record would have proceeds of 100.980822, which is exactly what they should have made for holding the security for 358 days.¹⁸ If the buyer holds the security to the income payment date, they negative accrued interest will decrease to zero and the market value of the security will be equal to the clean price, which has been assumed to remain at par. They will of course not receive the coupon. This means the buyer will have paid 99.980822 to buy the security on 8 January but it will be worth 100 on 15 January, which means that they will have made a return of 0.019178, which is exactly what they should have made for holding the security for seven days.

If, instead, the holder of record waits to sell 100 nominal of the security on 11 January, they will receive 99.989041. This is the clean price of 100 less the four remaining days of negative accrued interest. On 15 January, they will receive the coupon of 1.00. Ignoring the time value of money, the holder of record would have proceeds of 100.989041, which is exactly what they should have made for holding the security for 361 days. If the buyer holds the security to the income payment date, they negative accrued interest will decrease to zero and the market value of the security will be equal to the clean price, which has been assumed to remain at par. They will of course not receive the coupon. This means the buyer will have paid 99.989041 to buy the security on 11 January but it will be worth 100 on 15 January, which means that they will have made a return of 0.010959, which is exactly what they should have made for holding the security for four days.

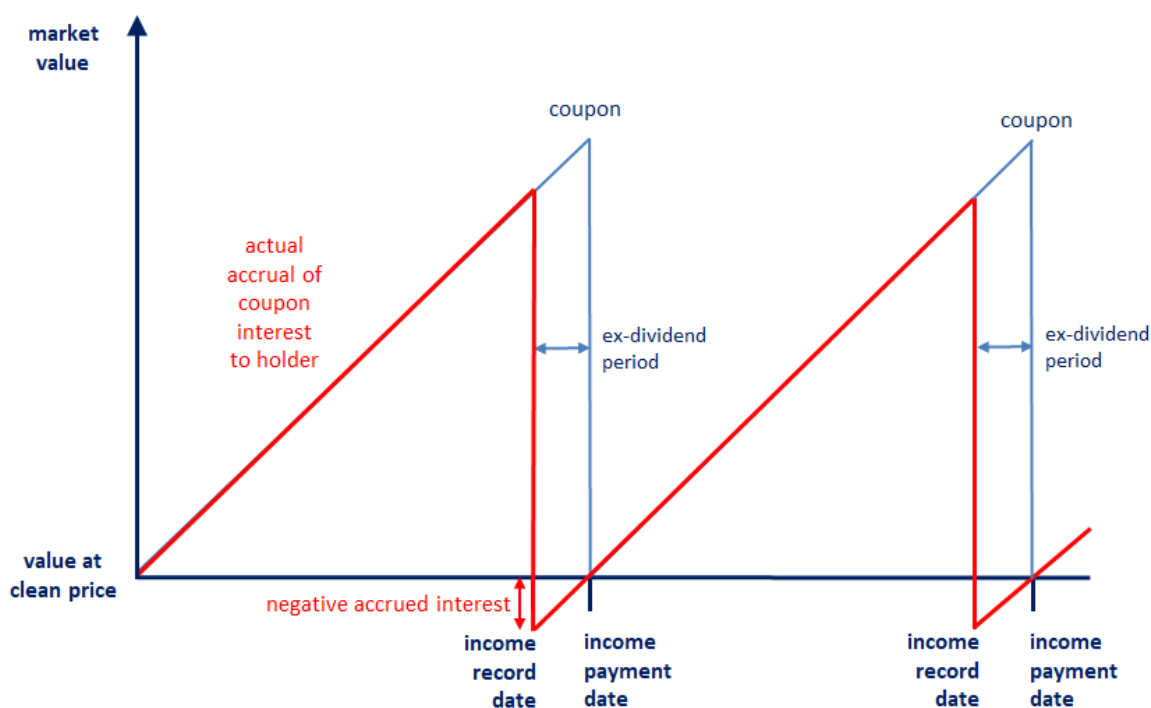
Given the impact of negative accrued interest on the market value of a fixed-income security, when calculating the purchase price of a repo:

- if the purchase date is before the income record date, then the market value of the bond is fixed in the normal way, at the clean price times the nominal value plus accrued interest for the days since the previous income payment date;
- if the purchase date is during the ex-dividend period, then the market value of the bond is fixed at the clean price times the nominal value minus negative accrued interest from the purchase date to the next income payment date.

If the purchase price is fixed at the market value less any haircut, then the repurchase price is simply that market value less any haircut plus repo interest. The ex-dividend period has no further direct impact on the repo.

¹⁸ This example assumes for simplicity that the holder of record has held the security since the previous income payment date but it would not change the economics if it is assumed that they had bought the security after the previous payment date as they would have paid the market value at that date, including accrued interest up to the date of purchase, so would have made a net return equal to the coupon interest accrued between purchase and sale.

If the purchase date of a repo is before the income record date but the repurchase date is during the ex-dividend period, then the market value of the bond will be positively affected by normal accrued interest until the income record date and negatively affected from that date by negative accrued interest but the effect of negative accrued interest will decrease over time. Other things being equal including no variation margin, this will mean that the transaction exposure of the buyer will decrease until the income record date, when it will increase by the amount of negative accrued interest.¹⁹ As the buyer will be the holder of record, they will have the comfort of knowing they should receive the coupon on the income payment date but, having to liquidate during the ex-dividend period would mean the loss of negative accrued interest, although this decreases over time. The net result is that, ignoring the time value of money and the market impact of liquidation, the buyer should be able to recover an amount equal to the clean price of the security plus normal accrued interest up to the date of liquidation. The negative effect of negative interest is therefore one of time value. This is illustrated in the diagram below.



If the purchase date of a repo is during the ex-dividend period but the repurchase date is after the income payment date, the buyer will have paid the clean price less negative accrued interest in the purchase leg of the repo but could liquidate subsequently at the clean price less a smaller amount of negative accrued interest. Other things being equal, this means that negative accrued interest will cause the transaction exposure of the buyer to decrease until the income payment date (albeit at a decreasing rate) and the accrued interest on the new coupon will further reduce the transaction exposure of the buyer after the income payment date. The net result is that, ignoring the time value of money and the market impact of liquidation, the buyer should be able to recover an amount equal to the clean price of the

¹⁹ The potential loss is equal to (1) the amount of any fall in the clean price of the collateral since the purchase date plus (2) the negative accrued interest at liquidation minus (3) accrued repo interest.

security plus normal accrued interest up to the date of liquidation. The positive effect of negative interest is therefore one of time value.

In summary, negative accrued interest has a diminishing negative effect on the transaction exposure of the buyer in a repo if the repurchase date but not the purchase date falls in the ex-dividend period but a diminishing positive effect if the purchase date but not the repurchase date falls in the ex-dividend period.



ICMA Zurich

Dreikönigstrasse 8
CH-8002 Zurich
Switzerland
T: +41 44 363 4222

ICMA Limited, London

110 Cannon Street
London EC4N 6EU
United Kingdom
T: +44 20 7213 0310

ICMA Paris

62 rue la Boétie
75008 Paris
France
T: +33 1 70 17 64 72

ICMA Hong Kong

Unit 3603, Tower 2,
Lippo Centre
89 Queensway Admiralty
Hong Kong
T: +852 2531 6592

membership@icmagroup.org
www.icmagroup.org