ICMA

International Capital Market Association

# ICMA Workshop:
# Professional Repo & Collateral Management

## 11-12 September 2019
## Eschborn

Supported by:

eurex repo

ICMA
International Capital Market Association

# Professional Repo Market & Collateral Management Workshop

## 11-12 September 2019, Frankfurt

**Deutsche Boerse, Mergentalerallee 61, 65760 Eschborn, Germany**

## Day 1 Agenda

**08:30 Registration, Tea & Coffee**

**09:00 Welcome to delegates from host**
Frank Gast, Managing Director, Eurex Repo GmbH

**09:15 The repo instrument: legal, economic and operational character**
Richard Comotto, ICMA Centre

**10:10 Types of repo: repurchase transactions v buy/sell-backs; floating-rate, open, evergreen, forward, term & synthetic repo; GC v specials; repo v securities lending**
Richard Comotto, ICMA Centre

**10:30 Coffee Break**

**10:50 Types of repo (continued)**
Richard Comotto, ICMA Centre

**11:50 Use of repos with bonds & derivatives**
Fabian Litsch and Lars Schult, DekaBank

**12:40 Lunch**

**13:40 Trading credit repo**
Sarabdeep Singh Lotay, Bank of America Merrill Lynch

**14:40 Trading forward repo [Slides will not be circulated to delegates, due to compliance]**
Ludovic Quidal, UBS

**15:20 Coffee Break**

**15:40 The structure of the European repo market and trends: a view from the European repo survey**
Richard Comotto, ICMA Centre

**16:20 Repo market infrastructure**
Richard Comotto, ICMA Centre

**17:00** **Course finish, networking reception**

**18.00** **End of Networking Reception**

# Day 2 Agenda

**08:30** **Registration, Tea & Coffee**

**09:00** **Margin (initial margin/haircut, variation margin)**
Richard Comotto, ICMA Centre

**09:40** **CCP: margining & default management**
Kevin Rettberg, Trader – Default Management, Eurex Clearing AG

**10:30** **Coffee Break**

**10:50** **Who uses tri-party repo and why? A bank user's view.**
Benjamin te Kaat, Director, Head of Sales DACH, BNY Mellon Markets

**11:30** **Who uses tri-party repo and why? A non-bank user's view. [Slides will not be circulated to delegates, due to compliance]**
Roman Zeiss, Head of Treasury Frankfurt, Deutsche Börse AG

**12:10** **Basel capital & liquidity calculations for repo: RWA, LR, LCR & NSFR**
Richard Comotto, ICMA Centre

**12:50** **Lunch**

**13:50** **The transition to €STR: the time is now!**
Pascal Nicoloso, Principal Market Operations Expert, European Central Bank

**14:25** **CSDR Mandatory Buy-ins**
Andy Hill, Senior Director, ICMA

**15:00** **Coffee Break**

**15:20** **SFTR**
Richard Comotto, ICMA Centre

**16:30** **Course finish**

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# ICMA Workshop: Professional Repo and Collateral Management

Wednesday, 11 Sep to Thursday, 12 Sep 2019

Eschborn, Germany

## Delegates

| First Name | Surname | Job Title | Company |
|---|---|---|---|
| Bob | Pijl | Strategy & Business Development | ABN AMRO Bank N.V. |
| Lindita | Blakaj-Jashari | Senior Treasury Specialist | AO Raiffeisenbank |
| Luis | Martins | Global Head of FX & G10 Rates | Banco Bilbao Vizcaya Argentaria, S.A. |
| Sara | Canovi | Collateral Management | Banco BPM S.p.A. |
| Sirpa | Kuivaniemi | Market Operations Expert | Bank of Finland |
| Arnaud | Trebaol | Economist | Banque de France |
| Simone | Mattea | Collateral Manager | Basler Kantonalbank |
| Alberto | Carbonell | Institutional Sales | Cecabank, S.A. |
| Javier | Diaz Santoyo | FX Trader, Sovereign Risk & Derivatives | Cecabank, S.A. |
| Zdeňka | Hemková | Operations Specialist | Ceská sporitelna, a.s. |
| Olga | Vanická | Manager of Financial Markets Back Office | Ceská sporitelna, a.s. |
| Torsten | Komorek | Director | Commerzbank AG |
| Jean-Louis | Beckers | Banking Supervisor | Commission de Surveillance du Secteur Financier (CSSF) |
| Michaela | Seifert | Banking Supervisor | Commission de Surveillance du Secteur Financier (CSSF) |
| Olga | Larsen | Senior Operations Specialist | Danske Bank A/S |
| Federico | Wienke-Maibach | Repo/Lending International Operations - Manager | DekaBank Deutsche Girozentrale |
| Ludger Michael | Migge | Senior Compliance Officer | DZ Bank AG Deutsche Zentral-Genossenschaftsbank |
| Ravinder | Kaur | Business Analyst, Clearing Design | Eurex Clearing AG |
| Julian | Rahusen | Eurex Market Supervision | Eurex Frankfurt AG |
| Katja | Renner | Funding & Financing Sales | Eurex Frankfurt AG |
| Katrina | Ryan | Fixed Income Sales Manager | Eurex Frankfurt AG |
| Dafina | Hamza | Regulatory & Financial Analysis | Eurex Repo GmbH |
| Christopher | Pawlik | Funding & Financing Product Design | Eurex Repo GmbH |
| Melissa | Richter | Regulatory & Financial Analysis | Eurex Repo GmbH |
| Andrea | Riemann | Funding & Financing Sales | Eurex Repo GmbH |

| | | | |
|---|---|---|---|
| Matthew | Scharpf | VP Fixed Income Funding and Financing Sales | Eurex Repo GmbH |
| Javier | Bravo | Treasury | Euroclear Bank S.A./N.V. |
| Eirini | Michou | Liquidity Officer | European Investment Bank |
| Maria | Kartcheva | Principal Portfolio Manager | European Stability Mechanism (ESM) |
| Hans | Desmet | Business Consultant Financial Markets | KBC Bank N.V. |
| Ragan | Van den Hoek | Risk Manager ALM | Nederlandse Waterschapsbank N.V. |
| Stephanie | Elford | Product owner and Trader Fixed Income and Derivatives | Swedbank AB (publ) |
| Johnni | Andersen | Head of Liquidity Management | Sydbank |
| Eleni | Dima | Relationship Manager | The Bank of New York Mellon |
| Sarah | Karrouche | Relationship Manager | The Bank of New York Mellon |
| Frank | Lehnen | Repo Trader | VTB Bank (Europe) SE |

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# Speaker Biography

| | |
|---|---|
| **Name:** | **Frank Gast** |
| **Job title:** | **Managing Director** |
| **Company:** | **Eurex Repo GmbH** |

Frank Gast is a managing director of Eurex Repo GmbH and Head of Sales Europe for Eurex' Fixed Income Derivatives, Funding & Financing business. He has more than 20 years industry experience with a focus on business development and sales in repo, securities lending and collateral management.

Frank started his career with KPMG Consulting in Frankfurt 1998 advising exchanges, banks and start-up companies across Europe in the funding & financing business. He spent three years of his career with BearingPoint Ireland in Dublin before he joined Eurex in Zurich in 2009. Frank became a managing director of Eurex Repo in 2012. Since 2018 he is responsible as Head of Sales Europe for the Repo and Fixed Income Derivatives within Eurex and has a leading role to further integrate the fixed income sales teams at Eurex for both, trading and clearing.

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# Speaker Biography

**Name:** **Richard Comotto**

**Job title:** **Senior Consultant**

**Company:** **International Capital Market Association (ICMA)**

Senior Visiting Fellow at the ICMA Centre at the University of Reading in England and Senior Consultant to the ICMA. Richard is author of the ICMA's Guide to Best Practice in the European Repo Market, including its forthcoming SFTR Annex, and Repo FAQs as well as director of the ICMA semi-annual survey of the European repo market. He is also course director for the ICMA's annual Professional Repo Market & Collateral Management Course, the ICMA-ISLA GMRA-GMSLA Legal and Documentation Workshop, the one-day Intensive Repo Workshop and the SFTR Workshop. Richard also acts as a repo expert for the IMF, Asian Development Bank and other development organizations, advising on the creation and reform of repo and money markets in emerging markets. He served for 10 years in the Bank of England, including the Bank's Foreign Exchange Division and on secondment to the International Monetary Fund in Washington DC.

International Capital Market Association

**ICMA Professional Repo Market & Collateral Management Course**
**Frankfurt 11-12 September 2019**

# repo instrument

**Richard Comotto**
ICMA Centre
University of Reading
United Kingdom

ICMA CENTRE THE BUSINESS SCHOOL FOR FINANCIAL MARKETS

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# repo instrument

## topics

- legal structure
- economic operation

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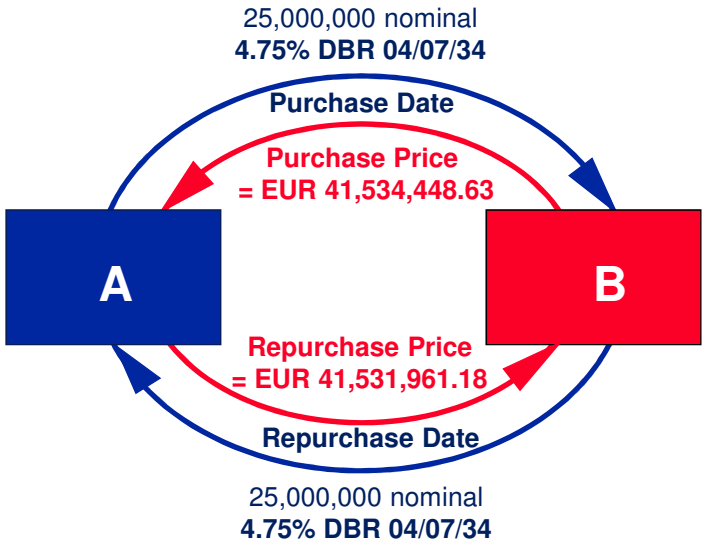
# legal structure

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# legal structure

## definition of repo

repo is a sale of a quantity of an asset & a simultaneous agreement to repurchase the same quantity of an equivalent asset at a future date or on demand for the original value plus a return on the use of cash

- quantity means same nominal amount of fixed-income securities (also called redemption value, face value, par value) or number of equities
- equivalent means a different part of same issue of securities
- return on use of cash is called “repo interest” in market but legally it is difference between purchase & repurchase prices

- exposures arising from changes in value of collateral & accrual of repo interest on the cash are managed collectively for all repos with the same counterparty using a single variation margin
- coupons or dividends paid on collateral during a repo are managed independently of the repo, usually by manufactured payments

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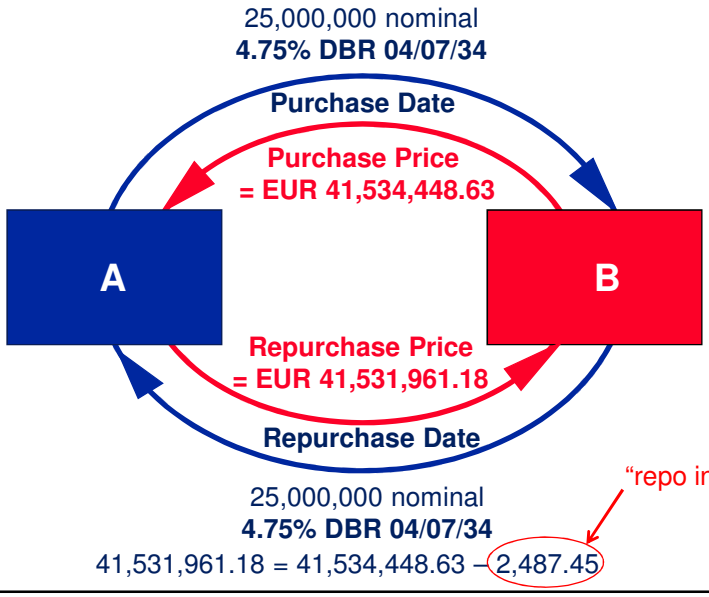
# legal structure

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# legal structure

## rights and obligations

- immediate sale & future repurchase of collateral means true sale or outright transfer of legal & beneficial title to collateral from seller to buyer
- buyer acquires
  - legal title = unencumbered right of use of collateral
  - beneficial title = rights to any benefits of ownership such as coupons or dividends, corporate action decisions, voting rights
- seller gives up:
  - all property rights in collateral in exchange for a claim against the counterparty
  - right to the return of the very same collateral: seller is only entitled to buy back equivalent assets

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# legal structure

## why sell collateral & why not give security interest?

- security interest is a traditional way of giving collateral
- security interest in the financial markets usually takes the form of a pledge
- if collateral is pledged, the cash borrower retains ownership of the collateral, so has the right to get back exactly the same asset that it pledged
- cash lender gets control & possession of pledged collateral (but not ownership)
- cash lender also gets right to liquidate or otherwise dispose of the collateral --- but only if the borrower defaults (there is no automatic right of re-use)

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# legal structure

## why sell collateral --- why not give security interest?

- because security interests are subject to the statutory insolvency process which usually means:
  - **pre-insolvency legal risks** --- lender has to perform certain formalities when taking collateral to protect his rights from other creditors during the insolvency process --- perfection requirements --- technical mistakes could lead to loss of the collateral
  - **post-insolvency risks** in particular:
    - cannot use insolvency as an event of default to terminate your repos if your counterparty defaults
    - close-out netting is legally impossible or impracticable with security interests
    - stays on enforcement of rights to dispose of collateral during insolvency process can delay liquidation for very long periods
    - retrospective invalidation rules may lead to variation margins received before insolvency being clawed back by insolvency court as being “suspect” transfers

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## legal structure

**why sell collateral --- why not give security interest?**

- because of the insolvency process, the enforcement of security interests will be delayed, expensive & uncertain --- unsuitable for short-term money market transactions
- EU Financial Collateral Directive should make use of security interests less risky but…

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## legal structure

**why transfer title**

- because, if cash lender becomes the owner of collateral at start of transaction, then:
  - cash lender is more certain about his ability to liquidate collateral & benefit from close-out netting if the counterparty defaults --- which reduces credit risk more than security interests do
  - cash lender has an automatic right to re-sell collateral during the term of the repo --- which reduces liquidity risk by allowing him to refinance himself & can offer opportunities to trade the collateral for extra profit

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# economic operation

## repos behave like secured loans

- economic behaviour of repo is different from its legal character
- obligation to make a future repurchase of collateral for its original value means that the transfer of title to the buyer is only temporary
- temporary transfer of title means a repo is effectively a loan of cash against a loan of collateral
- repo therefore functions like secured loan
  - capital at start = capital at end
  - difference between purchase & repurchase prices is return for use of cash analogous to interest & commonly called "repo interest"
  - it is common to talk in economic terms about "borrowing" & "lending" cash & collateral in a repo, even though legally it involves buying & selling --- but only talk economics to dealers, accountants, tax officials & regulators (not lawyers or courts)





# economic operation

## risk on collateral remains with the seller

- seller's obligation to make a future repurchase of collateral for its original value (plus repo interest) means risk on collateral impacts the seller, not the buyer
  - market risk --- if the collateral value falls, the seller repurchases at a loss
  - credit risk --- if the issuer of collateral defaults, the seller has to repurchase at higher pre-default price & suffer a loss
- repurchase leg is a forward transaction in which the seller hedges the buyer against risk on the collateral

# economic operation

## return on collateral goes to the seller

- obligation to make a future repurchase of collateral for its original value (plus repo interest) means that the return on the collateral benefits the seller, not the buyer --- which is appropriate & necessary since the seller is exposed to the risk on the collateral
- in case of fixed-income collateral, returns are:
  - capital gain from rise in the clean price of a bond --- seller repurchases at lower original price
  - income accrued during a repo --- accrued income attached to collateral will increase over life of a repo, adding to the market value of collateral, but the seller only has to repay the original market value to repurchase the collateral so interest accrued on collateral during a repo is a return to the seller
  - income paid during a repo --- goes to the buyer (as he is the owner) but the buyer is contractually obliged to make an equal and immediate (manufactured) payment to the seller

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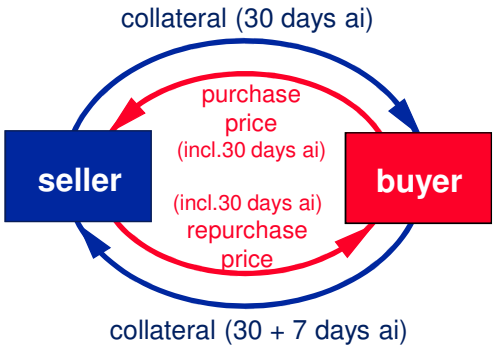
# economic operation

example of accrued income on collateral benefitting seller




7-day repo of bond with 30 days of accrued interest on purchase date

on purchase date, seller gives bond with 30 days of accrued interest & receives price including 30 days of accrued interest

on repurchase date, seller receives bond with 37 days of accrued interest but pays original price, which includes only 30 days of accrued interest

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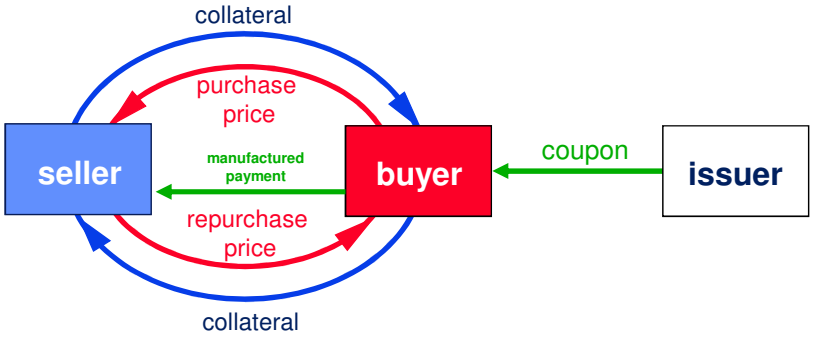
# economic operation

**when income is paid on collateral in a repurchase transaction**, the buyer should compensate the seller by means of an equal same-day manufactured payment




NB: there is a legally different but economically equivalent mechanism for buy/sell-backs.

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# economic operation

## summary

- **purchase** transfers the legal title to collateral to the buyer to:
  - reduce legal risk --- which further credit risk more than a security interest
  - allow the re-use of collateral at any time --- which reduces liquidity risk
  - reward the seller with more lending at lower rates
- **repurchase** transfers the risk/return on collateral to the seller in order to:
  - allow the seller to borrow cash & give a security as collateral but keep the risk/return on the security --- seller can use a repo purely for financing securities
  - allows the buyer to lend cash & take a security as collateral but without taking risk/return on the security --- the buyer can use repo purely for investing cash
- consequence is that, by the end of a repo, the seller gets back the collateral & any return (capital gains, income accrued or paid during the repo) as though the collateral had never been repoed out --- repo does not change the investment risk of the seller or expose the buyer to investment risk on the collateral

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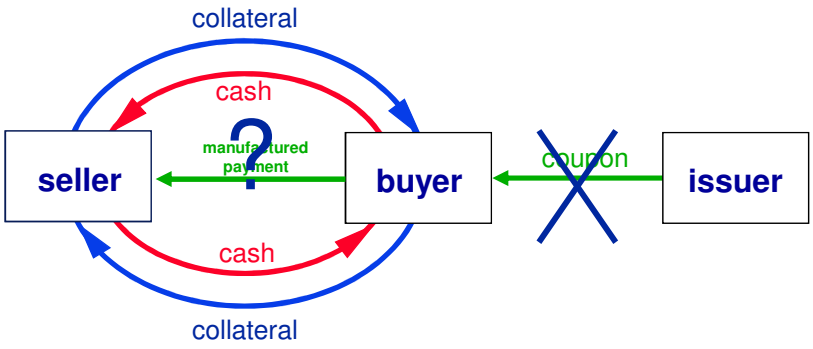
## economic operation

question --- if income is not paid on collateral, does buyer pay manufactured payment?

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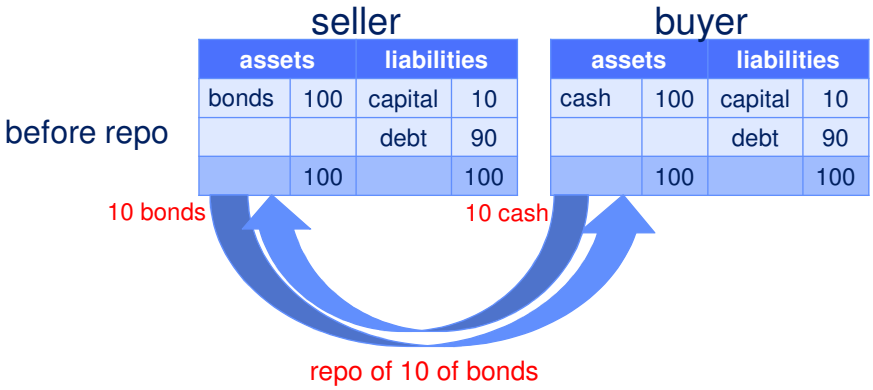
## economic operation

question --- how to account for repo?

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## economic operation

**answer** --- like a loan

- balance sheets should reflect "economic substance over legal form" --- this means the value & risk of assets & liabilities, not their contractual structure
- because of the commitment of the seller to repurchase collateral at its original value (plus repo interest), the risk & return on collateral remains with the seller
- therefore, collateral should not move from the balance sheet of the seller (no "derecognition") & should not appear on the balance sheet of the buyer (no "recognition")

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## economic operation

answer --- like an unsecured deposit

| | seller | | | | buyer | | | |
|---|---|---|---|---|---|---|---|---|
| | assets | | liabilities | | assets | | liabilities | |
| before repo | bonds | 100 | capital | 10 | cash | 100 | capital | 10 |
| | | | debt | 90 | | | debt | 90 |
| | | 100 | | 100 | | 100 | | 100 |
| | assets | | liabilities | | assets | | liabilities | |
| after repo | bonds | 100 | capital | 10 | cash | 90 | capital | 10 |
| | cash | 10 | debt | 100 | loan | 10 | debt | 90 |
| | | 110 | | 110 | | 100 | | 100 |

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# legal structure

## US repo is different

- title transfer may be subject to re-characterization risk in US (Lombard Wall 1984) as US courts look to the substance of a repo (what happens to risk)
- US Master Repurchase Agreement has a fall-back ---- should a court re-characterize a repo, it will become a pledge --- but with the problems of pledging solved by:
  - statutory exemption of repo pledges from basic rules of Bankruptcy Code (under called "safe harbor" provisions)
  - giving buyer a contractual general right of use
- result is different legal form but same economic effect as title transfer repo
- because of fall-back, US market talks about pledging & re-hypothecation but we should not!

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# legal structure

## "repos" that are not really repos

- many emerging markets trade instruments called repos
- but these are often secured loans to which name "repo" has been applied to give comfort to lenders
- such false repos do not transfer title to collateral & will therefore be caught by the insolvency process in a default
- false repos also do not allow automatic re-use of collateral by buyer
- use of false repos is often driven by problems in the law about giving collateral by transfer of legal title & sometimes by inadequate securities settlement systems

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# legal structure

## corporate events

- equity & some corporate bonds are subject to corporate events which change the character of the security (eg stock splits, redemptions) & may offer extra benefits
- question posed by occurrence of corporate event is: what is the equivalent collateral that has to be returned by buyer?

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# legal structure

## corporate actions

- some corporate events involve the exercise of an option --- these are corporate actions (eg rights issue)
- question posed by occurrence of corporate action is: who is entitled to exercise the option?

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# legal structure

## corporate events

- GMRA was designed for short-term repos in plain vanilla government bonds for which corporate events are few & infrequent
- GMRA 2000 & 2011 identify what are equivalent securities after some corporate events
- GMRA Equity Annex provides further guidance

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# legal structure

## corporate actions

- who makes choice?
- buyer is legal & beneficial owner of purchased securities --- those delivered by seller on purchase date delivered subsequently
- seller can have no control over these securities
- however, what constitutes equivalent security is not same property as original delivery, so seller has right to say what he wants back
- GMRA Equity Annex follows this approach & expressly gives corporate action to seller
- GMRA main text is silent

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# legal structure

## voting rights

- equity carries voting rights
- these rights go to the beneficial owner --- buyer
- seller can ask buyer to vote in line with his wishes but buyer is under no obligation to do so
- corporate governance codes say buyers should not exercise votes as they are not long-term investors





# types of repo

## topics

- repurchase transaction
- buy/sell-back
- variants of repurchase transactions
- GC v specials

# types of repo

there are in fact, three types of repo

- repurchase transactions
- undocumented buy/sell-backs (no written contract)
- documented buy/sell-backs

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# repurchase transaction

| | |
|---|---|
| **term** | 1 week |
| **collateral** | 4.75% DBR 04/07/34 (annual A/A) |
| **nominal value** | 25,000,000 |
| **clean price** | 163.483 |
| **accrued interest** | 204 days |
| **repo rate** | -0.308% (A/360) |
| **Market Value** | 41,534,448.63 |
| **Purchase Price** | 41,534,448.63 no haircut/initial margin |
| **repo interest** | -2,487.45 |
| **Repurchase Price** | 41,531,961.18 |

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## repurchase transaction

### bond valuation method 1

nominal value x clean price = clean value

$$25{,}000{,}000 \times \frac{163.483}{100} = 40{,}870{,}750.00$$

nominal value x coupon =accrued interest

$$25{,}000{,}000 \times \frac{4.75 \times 204}{100 \times 365} = 663{,}698.63$$

clean value + accrued interest = market value

40,870,750 + 663,698.63 = 41,534,448.63

NB coupon calculation uses bond market basis

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## repurchase transaction

### bond valuation method 2

clean price + accrued interest = dirty price (all-in price)

$$163.483 + \frac{4.75 \times 204}{365} = 166.137795$$

nominal value x dirty price = market value

$$25{,}000{,}000 \times \frac{166.137795}{100} = 41{,}534{,}448.63$$

NB coupon calculation uses bond market basis

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# repurchase transaction

## repo interest calculation

- assuming no initial margin or haircut

$$\underset{\text{purchase price}}{41{,}534{,}448.63} \times \frac{-0.308 \times 7}{100 \times 360} = \underset{\text{repo interest}}{-2{,}487.45}$$

$$\underset{\text{purchase price}}{41{,}534{,}448.63} + \underset{\text{repo interest}}{-2{,}487.45} = \underset{\text{repurchase price}}{41{,}531{,}961.18}$$

NB repo return calculation uses money market basis

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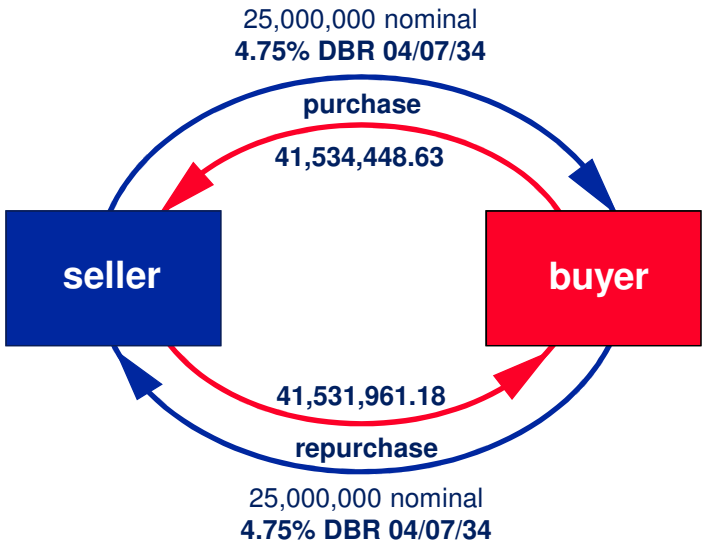
# repurchase transaction

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# repurchase transaction

*screen RRRA*






# buy/sell-back

| | |
|---|---|
| **term** | 1 week |
| **forward price** | 163.38195430 |
| **collateral** | 4.75% DBR 04/07/34 (annual A/A) |
| **nominal value** | 25,000,000 |
| **clean price** | 163.483 |
| **accrued interest** | 204 days |

clean value — accrued interest = 22,774 — repo interest = -2,487 — forward price

$$\frac{25{,}000{,}000\left(\frac{163.483}{100}\right) - \left(25{,}000{,}000\left(\frac{4.75 \times 7}{100 \times 365}\right) - 41.534{,}449\left(\frac{-0.308 \times 7}{100 \times 360}\right)\right)}{25{,}000{,}000} = 163.38195430$$

nominal value

# buy/sell-back

| | |
|---|---|
| **term** | 1 week |
| **forward price** | 163.38195430 |
| **collateral** | 4.75% DBR 04/07/34 (annual A/A) |
| **nominal value** | 25,000,000 |
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| **accrued interest** | 204 days |
| **Market Value** | 41,534,448.63 |
| **Purchase Price** | 41,534,448.63 no haircut/initial margin |
| **Repurchase Price** | 41,531,961.18 |

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# buy/sell-back

repurchase price - purchase price = repo interest

41,531,961.18 – 41,534,448.63 = -2,487.45

$$\left(\frac{\text{repo interest}}{\text{repurchase price}}\right)\frac{100 \times 360}{7} = \text{repo rate}$$

$$\left(\frac{-2{,}487.45}{41{,}531{,}961.18}\right)\frac{100 \times 360}{7} = -0.308\%$$

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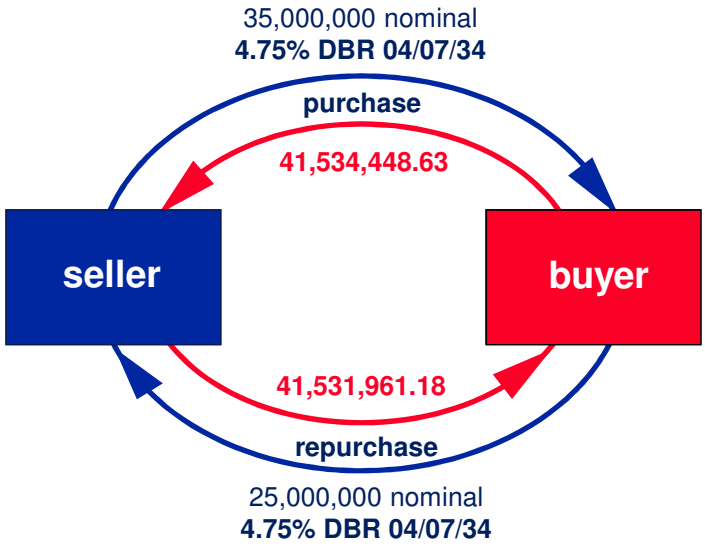
# buy/sell-back

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# buy/sell-back

**what is different about buy/sell-backs?**

- traditionally, buy/sell-backs were undocumented --- no written contract
- lack of written contract means undocumented buy/sell-backs are riskier:
  - weakens close-out netting rights in some jurisdictions
  - variation margining may be at risk in insolvency, may not be enforceable & may be unworkable without written provisions
- lack of a contractual relationship also means that manufactured payments cannot be used to manage income payments on collateral --- so buy/sell-backs have to use a different mechanism to deal with income payments on collateral

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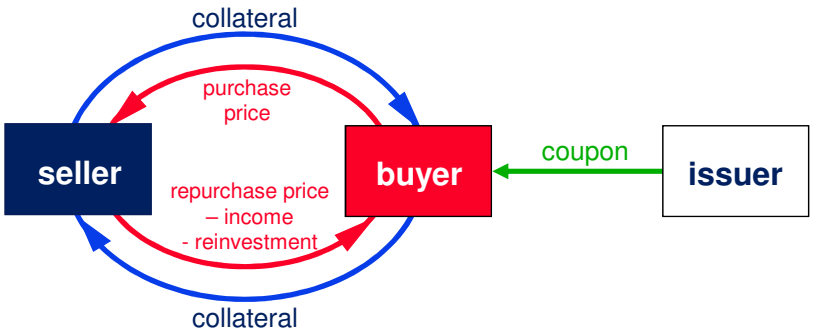
# buy/sell-back

## what is different about buy/sell-backs?

- when income is paid on collateral in an undocumented buy/sell-back, there is no manufactured payment
- instead the repurchase price is reduced by amount of income plus reinvestment interest to compensate for the delay between income payment date & repurchase date

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# buy/sell-back

*screen BSR*


NB These fields are parameters for the reinvestment of coupons

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## buy/sell-back

### why were documented buy/sell-backs created?

- recognition of collateral in regulatory capital adequacy calculations is subject to many conditions but in particular:
  - documentation of rights of close-out netting including in insolvency
  - inclusion of variation margin mechanism
- undocumented buy/sell-backs cannot meet these conditions so have higher regulatory costs

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## buy/sell-back

### why were documented buy/sell-backs created?

- one solution for users of undocumented buy/sell-backs would be to shift to repurchase transactions
- but some countries & some types of firm cannot adopt repurchase transactions, mainly because of the legal issues posed by some of the features of repurchase transactions
- main legal issue is manufactured payments --- a court could deem these to be a pass-through of coupon to the seller, who would then be seen as the owner of collateral, meaning that there has been no title transfer to the buyer
- variation margins & any provision for the substitution of collateral also often pose legal issues
- solution was to provide the Buy/Sell-Back Annex to allow the GMRA to create documented buy/sell-backs which could benefit from close-out netting & variation margining

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# buy/sell-back

## what is a documented buy/sell-back?

- Buy/Sell-Back Annex amends the GMRA to replace manufactured payments by the traditional buy/sell-back method for dealing with income payments on collateral --- adjustment of the repurchase price
- adjustment of the repurchase price can also avoid tax risk & operational challenges which can be posed by manufactured payments
- GMRA also includes an alternative to variation margining that was designed for buy/sell-backs but can also be used for repurchase transactions --- early termination of a buy/sellback with a material unsecured credit exposure & replacement with a new fully-collateralized buy/sell-back --- not much used in practice

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# buy/sell-back

## summary

- buy/sell-backs do not make manufactured payments but instead adjust the repurchase price --- this is the key difference with repurchase transactions
- reduction of repurchase price make open buy/sell-backs impracticable
- buy/sell-backs were traditionally undocumented but are now often documented under the Buy/Sell-Back Annex of the GMRA
- documentation of buy/sell-backs supports close-out netting in insolvency & provides for variation margining
- other differences historically associated with buy/sell-backs --- including method of quoting price --- are not important

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## variants of repurchase transactions

there are numerous variants of repurchase transactions

- fixed-rate
- floating-rate
- open
- evergreen
- extendible
- forward
- synthetic

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## variants of repurchase transactions

**fixed-rate repo**

- fixed repurchase date
- fixed repo rate
- return due at repurchase date
- but parties can agree to renegotiate contractual terms

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## variants of repurchase transactions

**floating-rate repo** --- short-term

- fixed repurchase date or open term
- repo rate linked to regularly updated index +/- spread
- passive interest rate risk management solution (alternative is to roll-over overnight repo which is operationally intensive)
- repo interest on short-term floating-rate repo is due at repurchase date as part of repurchase price
- overnight index-linked repo:
  - do not compound but average
  - if index fixing is too late for repurchase instruction, use penultimate fixing for last 2 days & settle difference later
- how to fix multiple interest rate periods --- check ICMA Guide





## variants of repurchase transactions

**floating-rate repo** --- longer-term

- term rate-linked repo (eg 1-month IBOR) --- interest usually paid at fixing --- check re-characterization risk
- repos over one year are floating-rate

## variants of repurchase transactions

**open repo** (on demand, terminable on demand)

- provision ready for use in GMRA
- no initial repurchase date --- at option of buyer or seller
- be clear about termination notice period
- avoids execution & settlement costs of rolling-over overnight repos
- repo rate reset by agreement --- “re-rating” --- so open repos are not floating-rate unless linked to index
- interest is not compounded
- repo interest paid, as pre-agreed, at (1) repurchase date, (2) when repo is re-rated or (3) an agreed number of days after each month-end

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## variants of repurchase transactions

**evergreen repo** (1)

- usually fixed-term but can be open term
- key feature is extended termination notice period
- termination at option of buyer or seller
- innovation in response to LCR, which can be avoided if termination notice period is over 30 days
- in fixed-term evergreen, notice can be given, as pre-agreed, on (1) one particular date, (2) one of a series of particular dates or (3) any day within the term
- repo rate reset ad hoc by agreement
- repo interest is paid, as pre-agreed, at (1) repurchase date, (2) when repo is re-rated or (3) (for open evergreens) an agreed number of days after each month-end
- check ICMA Guide

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# variants of repurchase transactions

## evergreen repo (2)

- alternative form of fixed-term evergreen has repurchase date which automatically moves to next business day until it is terminated or matures

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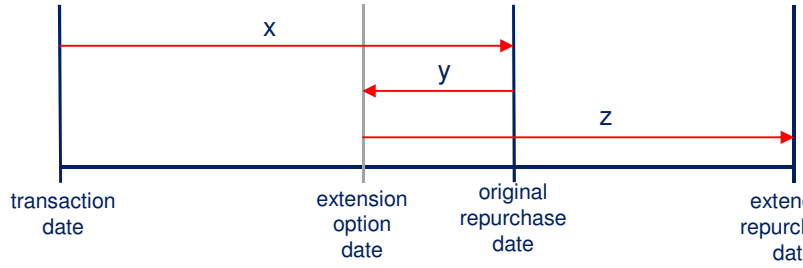
# variants of repurchase transactions

## extendible repo

- fixed-term repo with a repurchase date that can extended to an agreed later date by the seller at an agrred date during the original term
- described in terms of a series of three numbers x-y-z
  - x = months to original repurchase date
  - y = months before original repurchase date on which extension option can be exercised
  - z = months from option date to extended repurchase date

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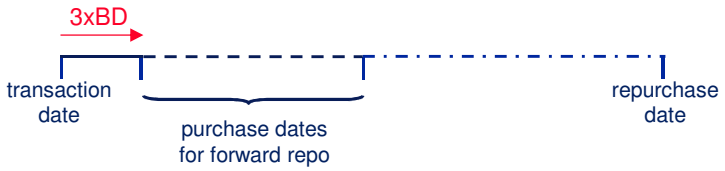
# variants of repurchase transactions

## forward repo

- described in part 2 of GMRA Annex I
- purchase date later than latest conventional purchase date
- default in GMRA is T+3
- under GMRA, there is no variation margin until the forward purchase date but best practice is to move to margining from transaction date
- collateral can be agreed in general terms & then allocated just before forward purchase date
- how to fix forward dates --- check ICMA Guide

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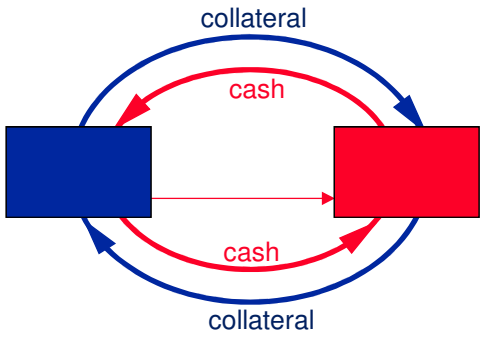
# variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?




**repo**

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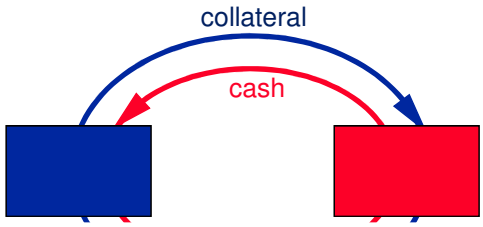
## variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?




**cash transaction**

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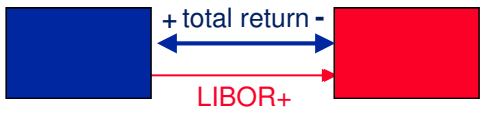
## variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?




**total return swap**

- TRS pays total return = change in total value of reference asset
- over contract period
- if total return is positive, red pays blue

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## variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?


**total return swap**

- TRS pays total return = change in total value of reference asset
- over contract period
- if total return is positive, red pays blue
- if total return is negative, blue pays red

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## variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?


**total return swap**

- TRS pays total return = change in total value of reference asset
- over contract period
- if total return is negative, blue pays red

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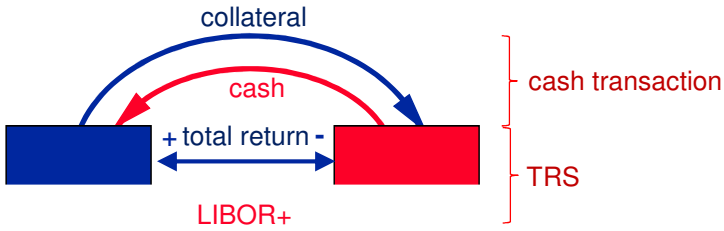
## variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?




**cash transaction + total return swap**

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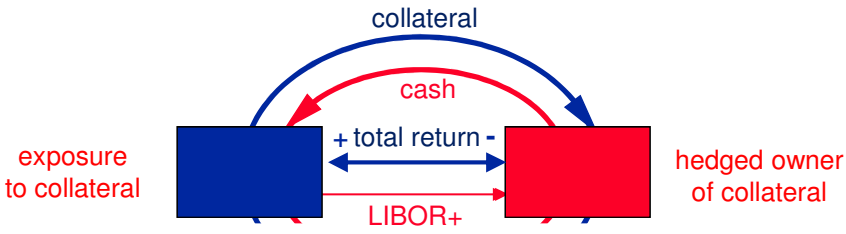
## variants of repurchase transactions

**questions** --- who has ownership & who has risk/return?




**synthetic repo**

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# variants of repurchase transactions

## some features of synthetic repos

- repurchase by gentleman's agreement
- can be between different counterparties
- TRS can be substituted by other derivatives (futures, delta-one exchange-traded options, OTC option combos)
- more common in equity

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# variants of repurchase transactions

## why do synthetic repos?

- cash costs LIBOR+ rather than repo rate
- extra cost should be offset by balance sheet neutrality = capital saving --- possible under US GAAP (as cash-settled transactions or using index CDS) but not under IFRS
- but preferential treatment under Leverage Ratio due to easier netting of derivatives & less impact on LCR & NSFR
- reduction of hedge fund willingness to allow re-hypothecation of assets in favour of segregated custodial accounts
- rationing of balance sheet by prime brokers
- synthetics allow new prime brokers to compete to allow hedge funds to diversity their prime brokers

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## variants of repurchase transactions

### why do synthetic repos?

- only ISDA documentation needed
- avoids legal uncertainty, restrictions on repo
- allows access to repo for parties without collateral management
- preserves repo lines for liquidity management
- may allow tax arbitrage
- avoids corporate actions
- popular for emerging markets:
  - reduces exposure to risks of tax & capital controls;
  - avoids expensive & difficult registration for local securities trading;
  - may avoid tax obstacles;
  - avoids poor clear & settlement infrastructure
  - avoids unreliable communications infrastructure

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## variants of repurchase transactions

### why do synthetic repos?

- some synthetic financing is replacement of leveraged positions (security plus repo) with derivatives:
  - no settlement
  - allows shorting without need to borrow for parties not eligible to borrow
  - allows UCITS hedge funds (UCITS wrapper used to access institutional & retail capital) to circumvent prohibition of physical short-selling

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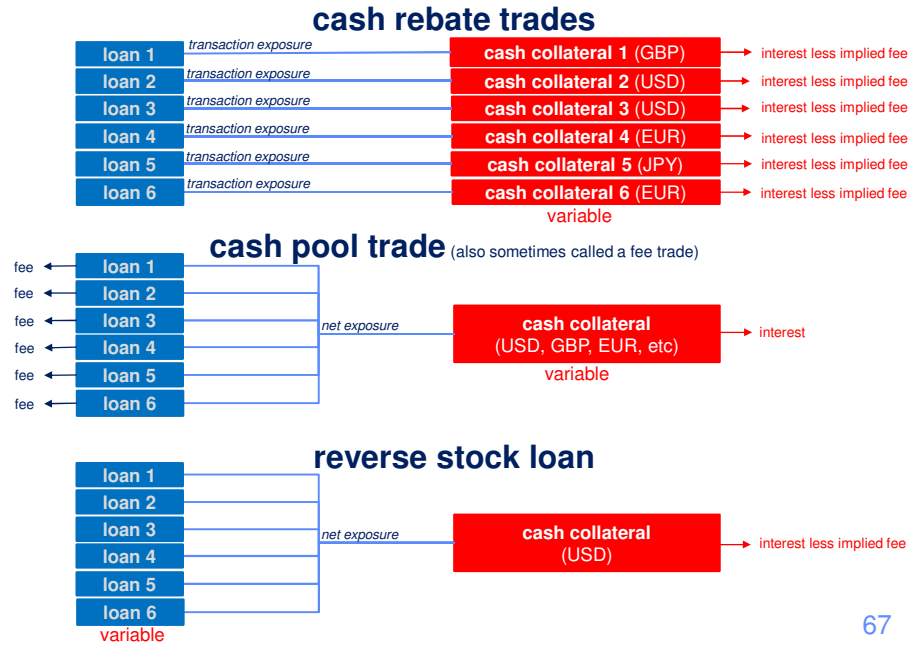
# variants of repurchase transactions








# GC v specials markets

## topic

- what is general collateral (GC)?
- GC repo rate
- what are specials?
- specials rates
- what makes collateral go special?

# what is general collateral (GC)?

## definition of general collateral

- in the OTC repo market, GC is a subset (called a “basket”) of security issues within the same class that are all equally acceptable among most buyers as collateral at the same repo rate (GC repo rate) --- buyers are indifferent between these issues which are therefore substitutes for each other
- GC usually taken to mean a subset of government securities or central bank eligible securities or HQLA
- OTC basket emerges by tacit consensus in market & is the result of interaction between repo dealers

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# what is general collateral (GC)?

## definition of general collateral

- in a GC trade, parties agree dates, amount & repo rate, then the collateral
- seller selects & proposes one or more of the securities in the basket
- buyer must approve selection unless eligible collateral has been pre-agreed
- because parties do not know, when fixing the repo rate, which security will be delivered, GC repo rate is cash-driven --- repo rate determined by supply/demand for cash
- GC repo is another money market instrument & alternative to unsecured lending of cash --- GC repo rate should therefore be highly correlated with other money market rates

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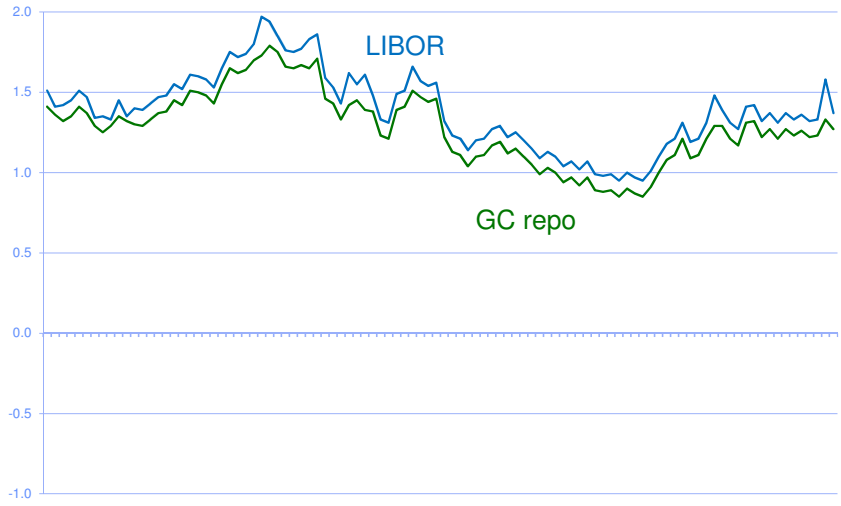
# what is general collateral (GC)?

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# what is general collateral (GC)?

## definition of general collateral

- GC is also a term used by automatic trading systems (ATS) & central counterparties (CCP) to describe the standard fixed baskets of security issues which they publish & from which sellers or tri-party management services can select for the settlement of trades executed on their 'GC trading or financing' facilities: anything else is called 'special'
- ATS & CCP define GC baskets in terms of central bank eligibility or by credit rating

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# GC repo rate

## definition of GC repo rate

- there is in fact a range of GC repo rates --- usually assumed to be 10bp wide --- due to differences such as inclusion of substitution option, termination option & termination notice period, CCP-clearing, use of tri-party collateral management services, method of delivery
- the GC repo rate is the highest of these rates
- GC repo rate often seen as (near) risk-free rate but it is difficult to insulate GC repo rate from collateral factors (general & specific) --- credible GC repo rate indices are very difficult to construct
- GC repo rate can be seen as repo rate on cheapest-to-deliver from GC basket





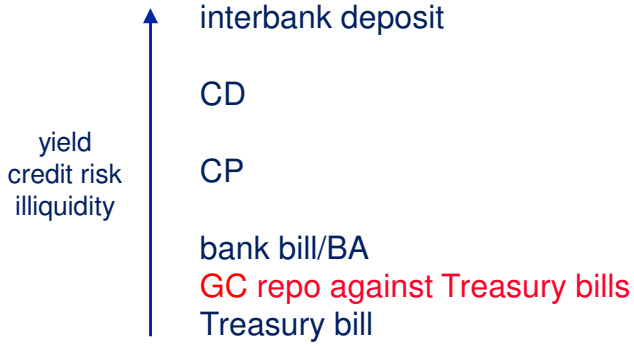
# GC repo rate

GC repo can be benchmarked against:

- other (unsecured) money market rates --- spread should measure credit & liquidity risks of unsecured funding --- but lack of arbitrage channels between repo & other money market segments due to market fragmentation means spread can be distorted
- central bank rate
- overnight index swap (OIS) curve

# GC repo rate

## benchmarking against other money market rates




*assume all instruments are for term & repo is against Treasury bill collateral*

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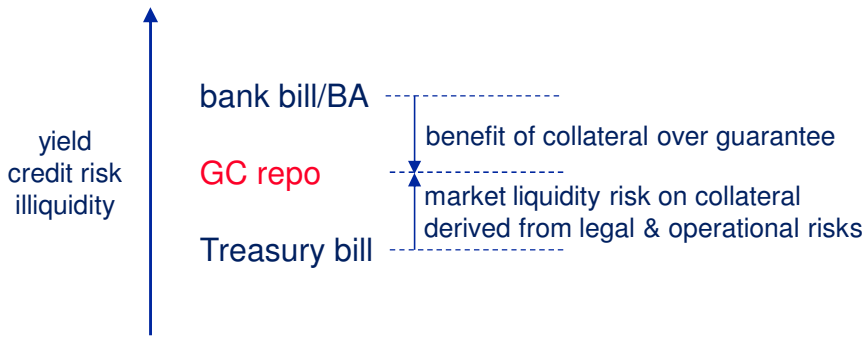
# GC repo rate

## benchmarking against other money market rates




*assume all instruments are for term & repo is against Treasury bill collateral*

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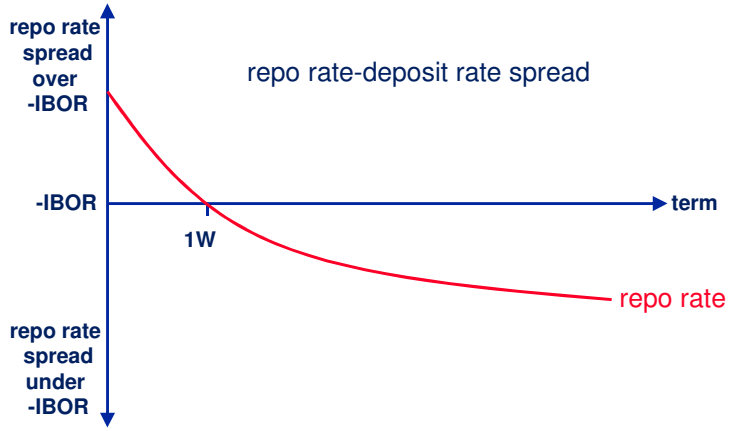
# GC repo rate

## distortions to the repo rate

lack of arbitrage channel between repo (used by securities dealers) & unsecured deposits (used by banks) means short-term GC repo rate can equal or exceed interbank deposit rate

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# what are specials?

## definition of a special

- **special** = single security issue trading in repo market below GC repo rate
- specials created by strong demand/scare supply of specific security issue --- security-driven repo
- specials buyer has to offer cheap cash to seller --- special rates can be negative
- each special has unique repo rate
- collateral is selected at start of negotiation
- specials are the most liquid securities --- valued by dealers & investors for narrower bid/offer & being easier to liquidate long positions & close out short positions
- loss of interest on cash loaned against special collateral is implicit premium paid for liquidity of special securities

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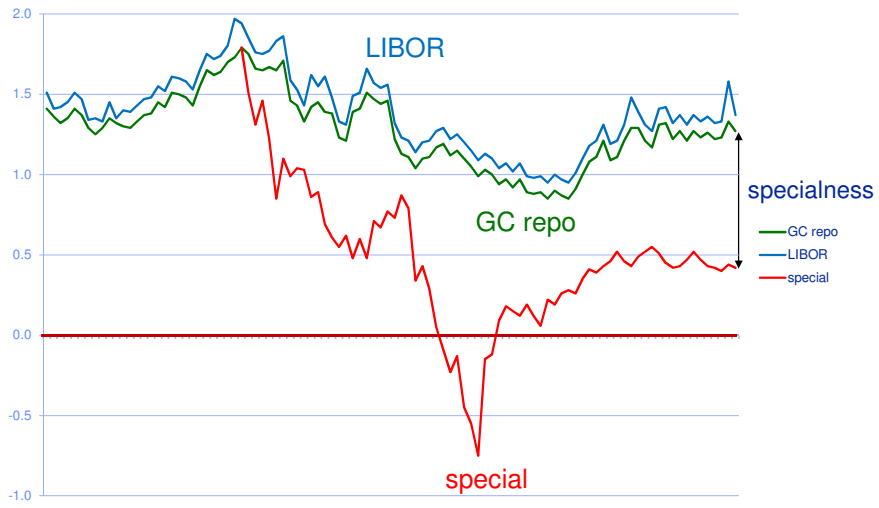
# what are specials?

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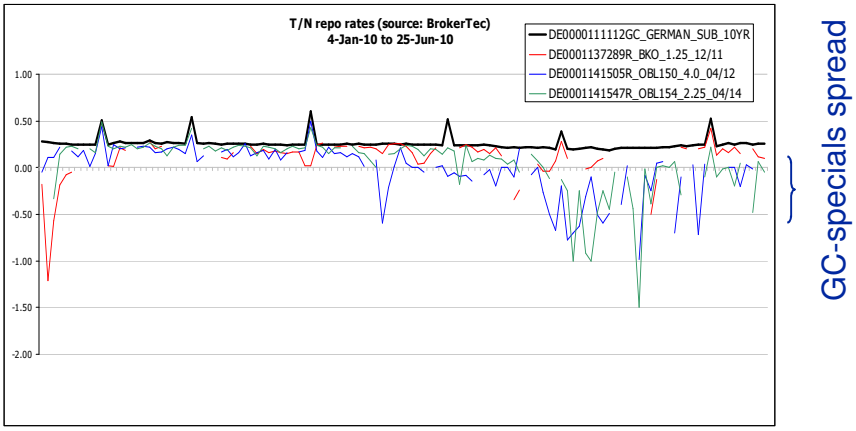
# what are specials?

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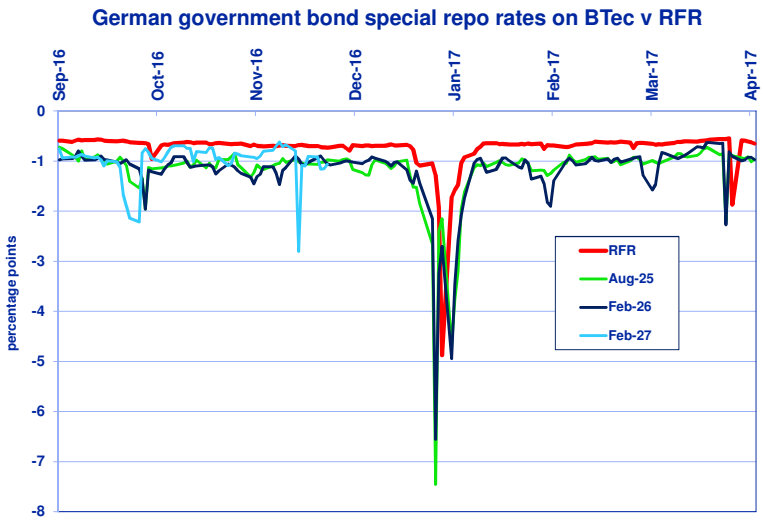
# what are specials?

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# what are specials?

## definition of a special

- special is also a term used by automatic trading systems (ATS) & central counterparties (CCP) to describe specific (non-GC) collateral being traded or cleared on their systems

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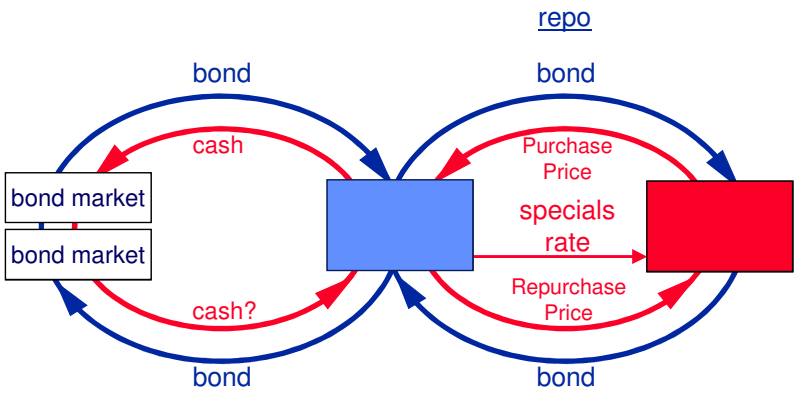
# what are specials?

## arbitrage link between repo & cash market

why not buy special in cash market & repo out for cheap cash?

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# what are specials?

## arbitrage link between repo & cash market

why not buy special in cash market & repo out for cheap cash?

| | |
|---|---|
| GC (ON) | 5.00% |
| special (ON) | 0.85% |
| specialness | 4.15% |

$$\text{capital premium} = \text{EUR}100{,}000{,}000 \times \frac{4.15 \times 1}{100 \times 360} = \text{EUR}11{,}528$$

- income gain from repoing out a special security should in theory be offset by extra capital cost of purchasing that security
- but market could be wrong

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# what makes collateral go special?

## what drives specials rates?

- excess demand
  - benchmarks --- heavily traded because on-the-run or deliverable
  - when bond becomes cheapest-to-deliver for futures and options
  - regulation (eg LCR creating demand for HQLA)
  - when current benchmark issues are borrowed to hedge auctions or taps of new issues
  - flights to safety
  - short-selling
  - end-period
- scarce supply
  - safe haven hoarding by risk-averse investors
  - market squeezes
  - anticipation of corporate actions
  - anticipation of income payments due to operational constraints on lenders
  - central bank purchases, especially QE
  - regulation (eg LCR reducing supply of HQLA)

# Use of Repos with Bonds & Derivatives

## Cash and Carry Arbitrage using Bond, Future and Repo

Fabian Litsch & Lars Schult, Frankfurt am Main, 12.09.2019



# Bond & Repo

## Relative Value, Forward Yield, and Forward Spread

# Bond & Repo

## bond example: DBR 0 ¼ 08/15/28 – 10jährige Bundesanleihe – Bund – aug28

| Bond | DBR 0 ¼ 08/15/28 |
|---|---|
| ISIN | DE0001102457 |
| Coupon | 0.25 |
| Maturity | 15. August 2028 |
| Issue Price | 98.90 |
| Current Price | 108.151 |
| Coupon Frequency | annual (once per year) |
| Convention | ACT/ACT |
| 1st Coupon Date | 08/15/2019 |
| 1st Settle Date | 07/13/2018 |
| Amount Outstanding | 21,000,000,000.00 |






# Bond & Repo

## forward prices are no coincidence and can be derived from current market data


- **bond trader's choice: buy low/sell high**
- **in our case we don't trade the bond, we trade the interest (differential)**
- **i.e. looking at bond, future and repo markets, the interest rate is the key, not the speculation on price changes (arbitrage not speculation/hedging)**
- **the underlying is used as a vehicle**
- **bond price is only indirectly needed to find the repo market price**
- **buy and hold-strategy is a different matter**

# Bond & Repo

price of underlying does not suffice to assess whether bond is cheap or expensive


***Bloomberg Spread Analysis (HS) will help***

- spot spread between aug28 and aug27 has narrowed significantly
- roughly from 14 to 6

***Is aug28 therefore expensive?***

- not necessarily
- depends on relative repo rates
- if bond is not only expensive in cash (spot) market
- but also expensive in the repo market (i.e. special = repo rate lower)
- it becomes less expensive on a forward basis.





# Bond & Repo

$$Forward\ Price = Spot\ Price - Coupon\ Income + Financing\ Cost$$

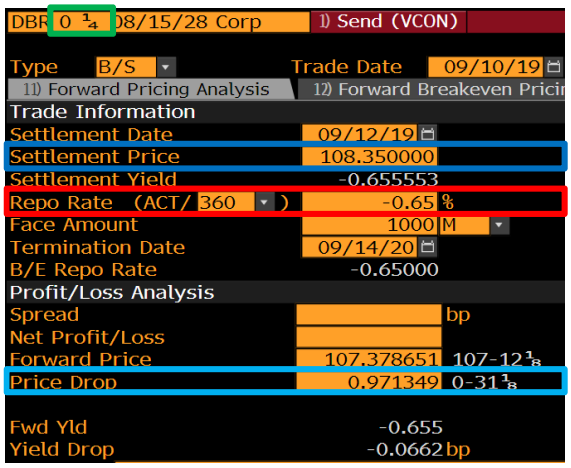
- $107.38 = 108.35 - 0.25 - 0.72$
- **price drop:** $107.38 - 108.35 = 0.97$
- **the following Bloomberg functions do the analysis**
- **enter "*DBR 8/28 Govt*" in Bloomberg, then use**
- *FPA* (Forward Price Analysis)
- *RRRA* (Repo/Reverse Repo Analysis)

| Bond | aug28 |
|---|---|
| Forward Price | 107.38 |
| Spot Price (Clean) | 108.35 |
| Accrued Interest | 0.02 |
| Coupon Income | 0.25 |
| Financing Cost | −0,72 |
| Interest (Repo) Rate | −0,65% |
| Last Coupon Date | 15.08.2019 |
| Spot Date | 12.09.2019 |
| Forward Date | 14.09.2019 |
| Days since Last Coupon | 28 |
| Days to Forward Date | 368 |
| Annual Basis Bond/Repo | 366/360 |

## Bond & Repo

*Forward Price = Spot Price − Coupon Income + Financing Cost*

- $107,38 = 108,35 - 0,25 - 0,72$
- ***FPA*** **(Forward Price Analysis)**
- **Spot (Clean) Price = given**
- **Interest (Repo) Rate = given**
- **Forward Price (Repo Rate)**
- **Forward Yield (Forward Price, Forward Date)**



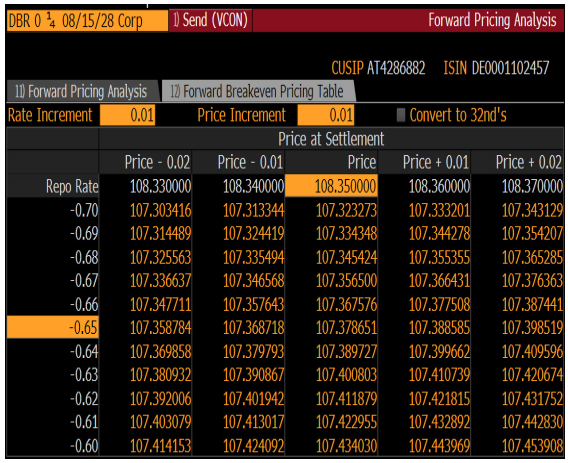





## Bond & Repo

*Forward Price = Spot Price − Coupon Income + Financing Cost*

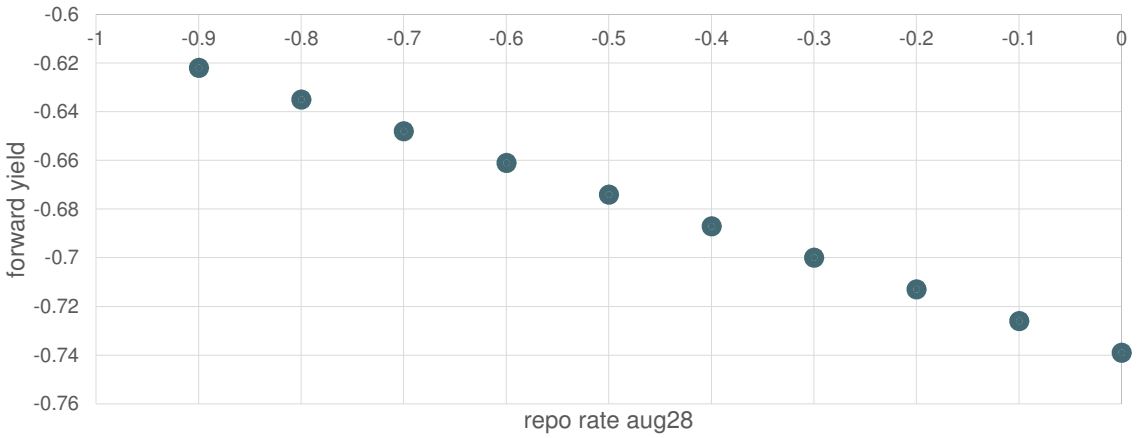
- **the higher the repo rate**
- **the higher the forward bond price**
- **the lower the forward yield**
- **or vice versa**
- **the lower the repo rate**
- **the lower the forward bond price**
- **the higher the forward yield**




| | Price at Settlement | | | | |
|---|---|---|---|---|---|
| | Price - 0.02 | Price - 0.01 | Price | Price + 0.01 | Price + 0.02 |
| Repo Rate | 108.330000 | 108.340000 | 108.350000 | 108.360000 | 108.370000 |
| -0.70 | 107.303416 | 107.313344 | 107.323273 | 107.333201 | 107.343129 |
| -0.69 | 107.314489 | 107.324419 | 107.334348 | 107.344278 | 107.354207 |
| -0.68 | 107.325563 | 107.335494 | 107.345424 | 107.355355 | 107.365285 |
| -0.67 | 107.336637 | 107.346568 | 107.356500 | 107.366431 | 107.376363 |
| -0.66 | 107.347711 | 107.357643 | 107.367576 | 107.377508 | 107.387441 |
| -0.65 | 107.358784 | 107.368718 | 107.378651 | 107.388585 | 107.398519 |
| -0.64 | 107.369858 | 107.379793 | 107.389727 | 107.399662 | 107.409596 |
| -0.63 | 107.380932 | 107.390867 | 107.400803 | 107.410739 | 107.420674 |
| -0.62 | 107.392006 | 107.401942 | 107.411879 | 107.421815 | 107.431752 |
| -0.61 | 107.403079 | 107.413017 | 107.422955 | 107.432892 | 107.442830 |
| -0.60 | 107.414153 | 107.424092 | 107.434030 | 107.443969 | 107.453908 |

## Bond & Repo

*Forward Price = Spot Price − Coupon Income + Financing Cost*

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## Bond & Repo

price of underlying does not suffice to assess whether bond is cheap or expensive

| DBR 0 ¼ 08/15/28 Corp | 1) Send (VCON) | | DBR 0 ½ 08/15/27 Corp | 1) Send (VCON) | |
|---|---|---|---|---|---|
| Type | B/S | Trade Date 09/09/19 | Type | B/S | Trade Date 09/09/19 |
| 11) Forward Pricing Analysis | 12) Forward Breakeven Pricin | | 11) Forward Pricing Analysis | 12) Forward Breakeven Pricin | |
| Trade Information | | | Trade Information | | |
| Settlement Date | 09/11/19 | | Settlement Date | 09/11/19 | |
| Settlement Price | 108.340000 | | Settlement Price | 110.074000 | |
| Settlement Yield | -0.654244 | | Settlement Yield | -0.729901 | |
| Repo Rate (ACT/ 360) | -0.65 % | | Repo Rate (ACT/ 360) | -0.55 % | |
| Face Amount | 1000 M | | Face Amount | 1000 M | |
| Termination Date | 09/10/20 | | Termination Date | 09/10/20 | |
| B/E Repo Rate | -0.65000 | | B/E Repo Rate | -0.55000 | |
| Profit/Loss Analysis | | | Profit/Loss Analysis | | |
| Spread | | bp | Spread | | bp |
| Net Profit/Loss | | | Net Profit/Loss | | |
| Forward Price | 107.376631 | 107-12 | Forward Price | 108.961431 | 108-30¾ |
| Price Drop | 0.963369 | 0-30⅞ | Price Drop | 1.112569 | 1-03⅝ |
| Fwd Yld | -0.653 | | Fwd Yld | -0.755 | |
| Yield Drop | -0.0822 bp | | Yield Drop | 2.5029 bp | |
| Notes | | | Notes | | |

$$Spot\ Spread = Settlement\ Yield_{aug28} - Settlement\ Yield_{aug27} = 7.56bp$$
$$Forward\ Spread = Spot\ Spread - Yield\ Drop\ Bond_{aug28} + Yield\ Drop\ Bond_{aug27} = 10.2bp$$

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# Futures

## Net Basis & Cheapest to Deliver



## Futures

### design of futures contracts

***High degree of standardization***

- highly liquid perfect for trading ideas & hedging
- risk mitigation concept (margin)
- standardized terms and maturity

***Futures contracts refer to the same underlying***

- usually future underlyings are equal goods
- e.g. commodities (oil, gold, copper, etc.) or equities
- easy to compare, no/little individual characteristics

***A future contract is a conditional forward transaction***

- standardized delivery process
- the futures' settlement date: 10th of delivery month (e.g. March, June, September, December for German Govt. Bond)

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# Futures

## design of a bond futures contract – contradicting conditions – an easy trick helps

***Apples and Oranges***

- bonds differ in essential features, e.g. time to maturity or coupon
- bond futures trade a synthetic underlying which is identical in maturity and coupon
- deliverable bonds have a maturity of 8,5 to 10,5 years

***Make eligible bonds equal: Define a synthetic bond***

- conversion factor is the link
- used to normalize deliverable bonds to synthetic bond
- coupon of synthetic bond = 6%, term = 10 years to maturity
- eligible bonds differ from synthetic definition
- a conversion factor links synthetic bond (basket) and deliverable bonds





# Futures

## futures example: Euro-Bund Futures Dec19 – key points and Bloomberg DES

- **futures contract is a synthetic bond**
- **a basket of deliverable bonds**
- **one fixed coupon (6%) for all bonds in the basket**
- **single futures price represents exchange's bid for every bond in the basket**
- **bonds in the basket are (almost) equalized using conversion factors**
- **delivery price is price of the futures on contract's delivery date (following slides)**
- **bonds or rather Bunds in dec19? aug28/29 & feb29**
- **where/how to find?**
- Bloomberg Function:
  - RXA Comdty (Euro Bund Active Contract), also RXZ9
  - DES
- Eurex Website

# Futures

## futures example: Euro-Bund Futures Dec19 – equations & calculations

| Future Name | RXZ9 Comdty |
|---|---|
| Future Price | 173.93 |
| Futur Coupon | 6% |
| Settle Date | 13.09.2019 |
| Delivery Date | 10.12.2019 |
| Days to Deliver | 88 |

| | aug28 | feb29 | aug29 |
|---|---|---|---|
| ISIN | DE0001102457 | DE0001102465 | DE0001102473 |
| Conversion Factor | 0.619552 | 0.602854 | 0.568893 |
| **Delivery Price** | 107.8385974 | 105.0845332 | 98.94755949 |
| **Gross Basis** | 0.39232064 | 3.40160378 | 8.33244051 |
| **Zero Gross Basis Futures Price** | 174.5632328 | 179.5725001 | 188.5767622 |
| Bond Price | 108,151 | 108,256 | 107,28 |
| Coupon | 0,25 | 0,25 | 0.00 |
| Accrued Interest Settlement | 0,019808743 | 0,169863014 | 0 |
| Accrued Interest Settle to Delivery | 0,06010929 | 0,060273973 | 0 |
| Days since Last Coupon | 29 | 248 | 66 |
| Annual Basis Bond | 366 | 365 | 366 |
| Implied Repo Rate | −0,013534923 | −0,125857513 | −0,323036704 |

$$\textit{Implied Repo Rate} = \frac{[FP_D + AI_D] - [BP_C + AI_C]}{[BP_C + AI_C]} \times \frac{360}{days_{D-C}}$$

$$\textbf{\textit{Delivery Price}} = \textit{Future Price} \times \textit{Conversion Factor} + \textit{Accrued Interest}$$

$$\textbf{\textit{Gross Basis}} = \textit{Bond Price} - \textit{Futures Price} \times \textit{Conversion Factor}$$

$$\textbf{\textit{Zero Gross Basis Futures Price}} = \textit{Bond Price}/\textit{Conversion Factor}$$

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# Futures

## futures example: Euro-Bund Futures Dec19 – Basket Overview/Bloomberg DLV (CtD)

RXZ9 Comdty | 97) Export to Excel | 98) Settings | Cheapest-to-Deliver

EURO-BUND FUTURE Dec19 Price 173.93 +.03 | Trade 09/11/19 | Delivery 12/10/19

Sort By | Settle 09/13/19 | Cheapest IRP -1.256

Implied Repo | Decreasing | Days 88 Act / 360

| Cash Security | Price | Chg | Conven Yield | Conver Factor | Gross Basis | Implied Repo% | Actual Repo% | Net Basis |
|---|---|---|---|---|---|---|---|---|
| Adjust Value | | Yld | | | | | | |
| 1) DBR 0 ¼ 08/15/28 | 108.1510 | +.001 | -0.6352 | 0.619552 | 0.392 | -1.256 | -0.432 | 0.218 |
| 2) DBR 0 ¼ 02/15/29 | 108.2560 | +.001 | -0.5989 | 0.602854 | 3.402 | -12.607 | -0.432 | 3.227 |
| 3) DBR 0 08/15/29 | 107.2800 | +.001 | -0.7058 | 0.568893 | 8.332 | -31.774 | -0.432 | 8.219 |

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# Futures

## Cheapest to Deliver – Why is the CtD the CtD?

***Future Delivery***

- From an arbitrage perspective, if you are short the future you deliver the bond which costs the least to fulfill your obligation. This bond is called „Cheapest to Deliver".

***Conversion Factor***

- The conversion factor is the price of a deliverable bond if it would trade at 6% at the futures delivery date. **As a result**, if all bonds trade at 6% at the delivery date, then every bond would have the same cost for delivery.


***Bond with low duration is likely the CtD***

- If actual bond yields are below the notional coupon, then the bond with a low duration tends to be sole CtD. This is because the price of a low duration bond rises by less than the price of a high duration bond if yields fall.
- In today's ultra low bond yield environment, there is a very strong tendency in all bond future contracts for the low duration bond to be CtD. The shorter the maturity of a bond and the higher its coupon, the lower its duration.





# Cash & Carry Arbitrage

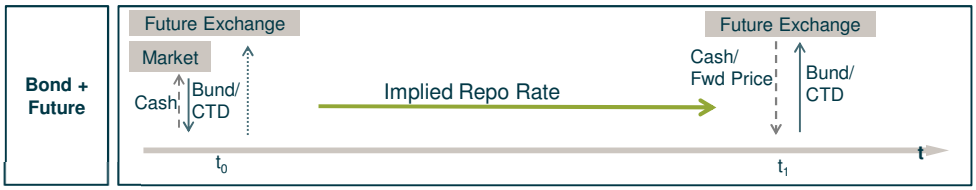
## Bond, Future, and Repo combined

# Cash & Carry Arbitrage

Bond, Future, and Repo combined

***Basic:*** **Repo Cash-Flows**


***"Advanced":*** **Synth. Repo Cash-Flows**




Trade if you identify different prices on different markets on the same underlying asset → **Basis Trading**

19

19

# Cash & Carry Arbitrage

Calculating aug28

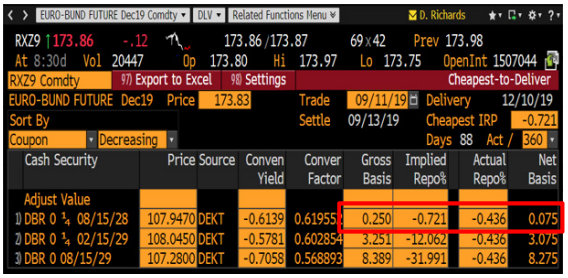
| Theory | Application |
|---|---|
| $\boldsymbol{Gross\ Basis} = Bond\ Price_{Spot} - Futures\ Price\ x\ Conversion\ Factor$ | $107.94 - 173.83 \times 0.619552$ |
| | $= +0{,}24$ |
| $\boldsymbol{Coupon\ Income} = Accrued\ Interest_{Delivery\ Date} - Accrued\ Interest_{Spot\ Date}$ | $0.25/360 \times (120 - 30)$ |
| | $= +0.0623$ |
| $\boldsymbol{Financing\ Cost} = Amount\ Financed \times Financing\ Rate \times (Days_{Delivery\ Date - Spot\ Date})/360$ | $(107.94 + 0.021) \times -0.0043 \times 90/360$ |
| | $= -0.116$ |
| $\boldsymbol{Net\ Basis} = Coupon\ Income - Gross\ Basis - Financing\ Cost$ | $0.0623 - 0{,}24 - (-0.116)$ |
| | $= -0.062$ |
| $\boldsymbol{Carry} = Coupon\ Income - Financing\ Cost$ | $0.0623 - (-0.116)$ |
| | $= +0.1783$ |

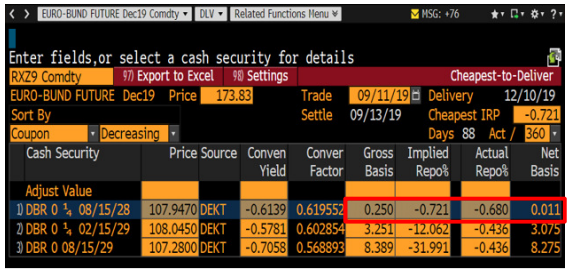
20

20

## Cash & Carry Arbitrage

Bond, Future, and Repo combined








## Thank you for your attention

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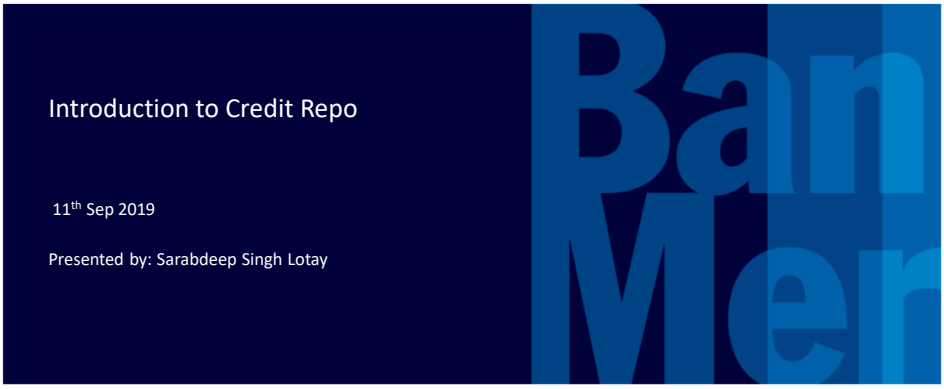
# Introduction to Credit Repo

11th Sep 2019

Presented by: Sarabdeep Singh Lotay



Bank of America Merrill Lynch

1

## My Background

Bank of America Merrill Lynch

- Graduated in Computer Science at UCL in 2006
- Took an interest into Finance and Banking
- Began my career at Lehman Brothers in Jul 2007 on the Markets Graduate training programme
- Was out of workaround the bankruptcy
- Joined the Citi Graduate training programme in 2009
- Spent a year trading Eurogovvie Repo
- Moved to Credit Repo in 2011, and remained in that area ever since
- Moved to BofAML in June last year to build out the Credit Repo business there



2

## What is Credit Repo

Bank of America Merrill Lynch

- Traditionally Credit would refer to G10 Corporate bonds
  - So bonds that are issued by companies
- However in Repo space, this would generally also include:
  - SSA (Sovereigns, Supras & Agencies)
  - ABS (Asset Back Securities)
  - Possibly even EM (Emerging Markets)





## Types of active market players

Bank of America Merrill Lynch

- Dealers
- Hedge funds
- Custodians/Security Lenders
  - On behalf of Real Money accounts
- Real Money accounts directly on certain occasions
- Interdealer brokers
  - Facilitate street trading

## What makes Credit Repo different to Government bond repo

Bank of America Merrill Lynch

Main difference would be

- As OTC as it gets
- Trading platforms (or lack of)
- Trade tenors
- Liquidity (or lack of)

I will expand on each of these in the following slides





## Trading Platforms

Bank of America Merrill Lynch

- Essentially, there are no trading platforms in Credit Repo
- Some have emerged (eg NGT, Eurex), but still are a small part of the market
- Vast majority of specials trading is done via Bloomberg messaging
- Very archaic, but has its benefits
- Means that trading levels are often not published publicly
  - Lack of pricing transparency
  - Lack of trade data

## What drives Credit repo rates pricing

Bank of America Merrill Lynch

- For long financing, it would be Eurogovvie repo + spread charged for worse quality collateral
  - This spread can be impacted by many factors (essentially supply/demand)
- For short covering, it is simply supply/demand in the purest sense
  - Demand driven by short sellers
  - Supply governed by lender community holdings
- Motivations for short bond positions could be a variety of things, including
  - Outright short
  - RV trades
  - Bond/CDS basis trades
  - Corporate actions
  - Special situations
- Repo rates can be exacerbated by operational issues
  - Fail sensitive client delivery
  - Buy-ins
  - Euroclear recalls





## Trade Tenors

Bank of America Merrill Lynch

- Long financing trades can be a variety of tenors, but usually upto around 3 to 6 months.
- However short covering trades are almost exclusively on open basis only
  - If not open, would be very short tenors eg < 1 month
  - Allows for flexibility for the underlying bond owner
  - They still receive their yield enhancement
  - Can make holding onto short positions long term difficult if bond becomes special
- Repo traders can take views on the bond by offering in term while borrowing on open
- This convention in tenor makes it quite different to Eurogovvie repo
- Downside is that it means lack of Fin41 netting

## Liquidity

Bank of America Merrill Lynch

- Considering bond issue sizes in Credit are relatively small, liquidity in the market is less
- Long financing is still quite a liquid market, b/o spreads still tight
- Short covering liquidity very sporadic
  - Depends so much on Sec Lender/Custodian (Real money) supply
  - Premium for a specific vs GC offer will always be there, but is reducing (more on this later)
  - Opaque market means offer levels can vary significantly
  - Data providers like Datalend have helped somewhat
  - Often lenders are the same way in a given bond
  - b/o spreads can be extremely wide





## Some Datalend rates of most special bonds

Bank of America Merrill Lynch

| | | |
|---|---|---|
| XS0520938647 | NDB 6 06/29/20 | 4893bps |
| XS1000393899 | ASTIM 7 1/8 12/01/20 | 2946bps |
| XS0208469923 | ALLRNV 4 1/2 12/17/19 | 2000bps |
| FR0011215508 | COFP 5.244 03/09/20 | 1391bps |
| USP7807HAM71 | PDVSA 12 3/4 02/17/22 | 1083bps |
| XS1654544136 | DIVRSY 5 5/8 08/15/25 | 960bps |
| XS1793296465 | TRAFIG 5 1/4 03/19/23 | 916bps |
| XS0881803646 | ERFFP 7 PERP | 901bps |
| DE000A2LQKV2 | SIXTLE 1 1/2 05/02/22 | 802bps |
| XS1650590349 | SHFSJ 1 7/8 01/24/25 | 800bps |
| XS1203941775 | MEOGR 1 1/2 03/19/25 | 792bps |
| XS1405774727 | INLOTG 6 3/4 09/15/21 | 767bps |
| XS1222731215 | TRAFIG 5 04/27/20 | 764bps |

## Trends over the last few years in Europe

Bank of America Merrill Lynch

- Flat yield curve upto 2 years, tighter spreads
- Hunt for yield, tighter spreads and increased risk appetite
- QE – initially caused liquidity issues
- Increased competition between banks

Current/Future Trends

- ETFs
- Client Platforms, eg GMLX and Tradeweb



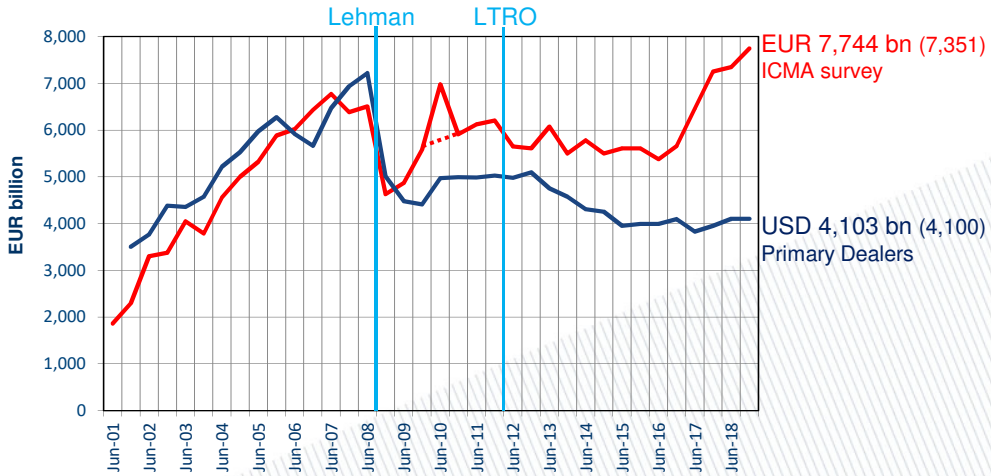


## Why am I still a Credit Repo trader

Bank of America Merrill Lynch

- Opaque market can create opportunities
  - Suits my skillset and background
- Balance sheet returns tend to be better
- Diverse range of products and collateral quality

## Headline numbers: ICMA & FRBNY surveys

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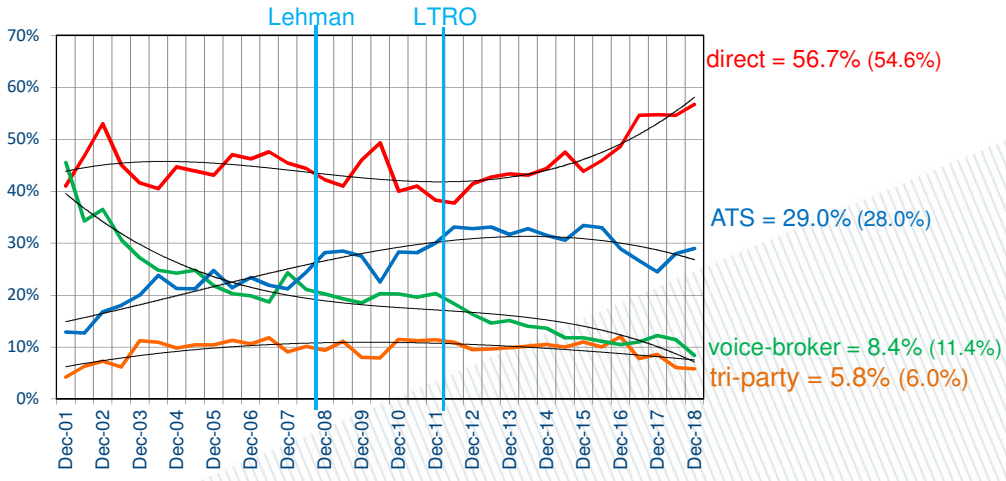
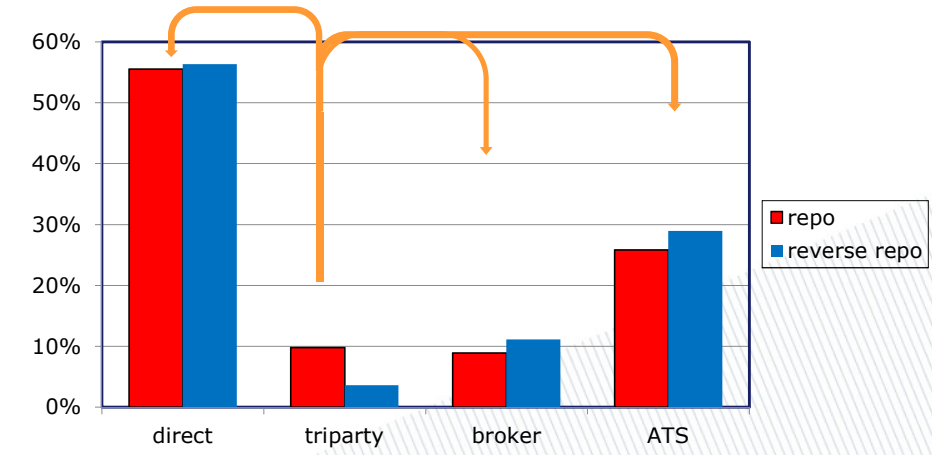
36th European repo market survey conducted in December 2018

## Trading Analysis




2

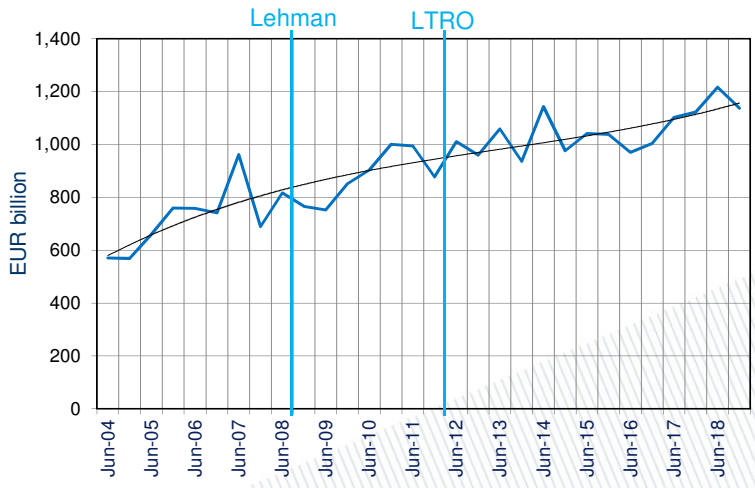
## Trading analysis



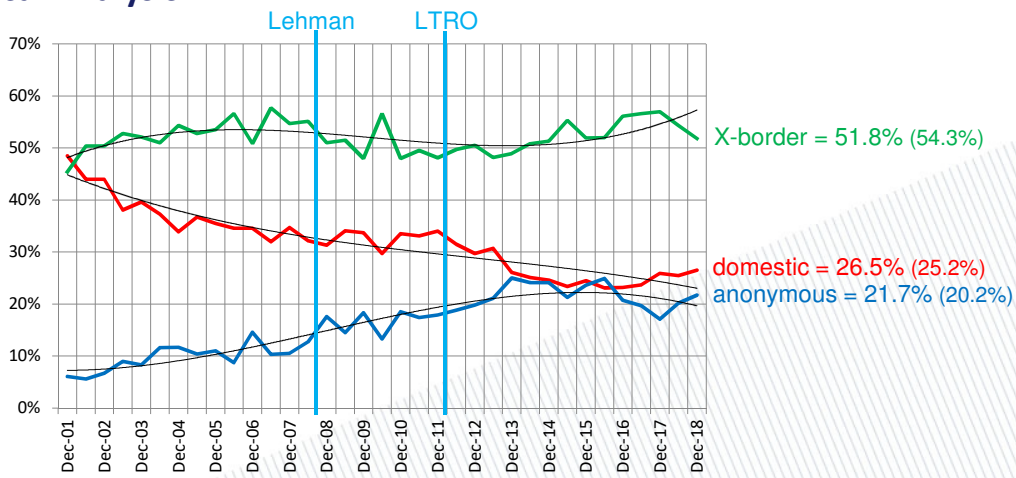





## Trading Analysis (directly reported by venues)



## Geographical Analysis

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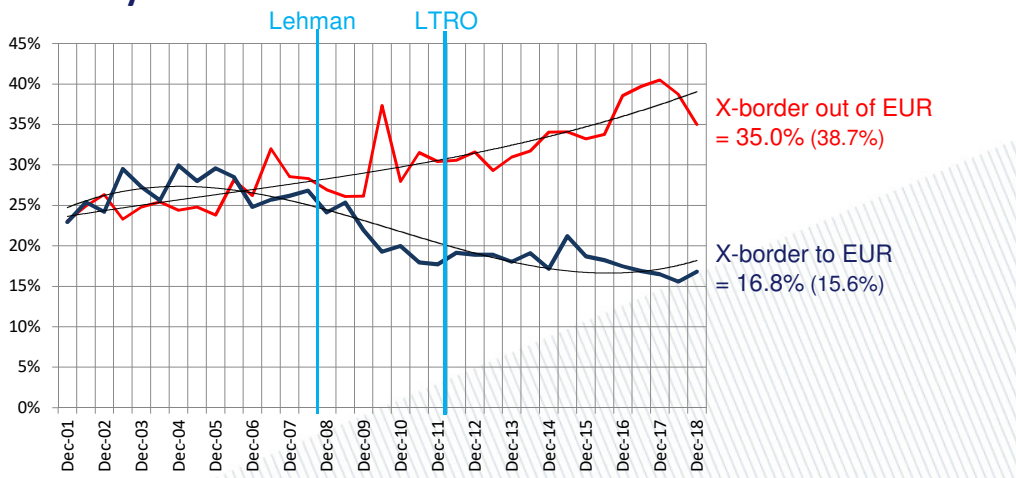
36th European repo market survey conducted in December 2018

## Geographical Analysis

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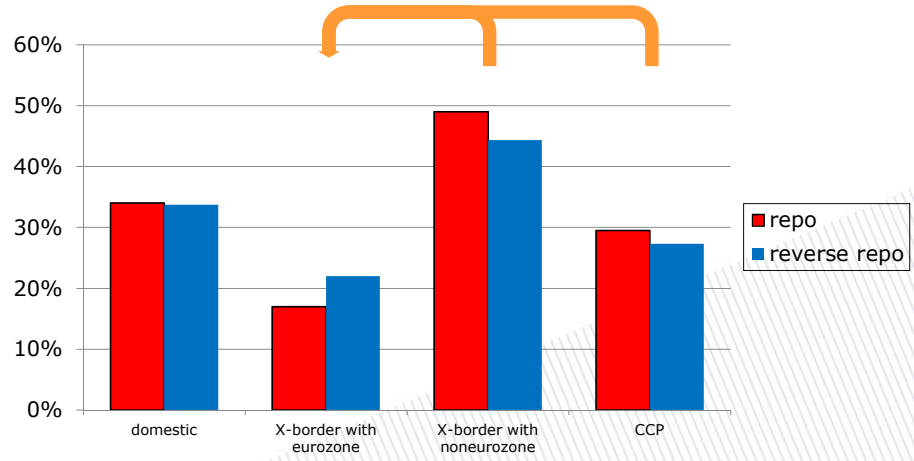
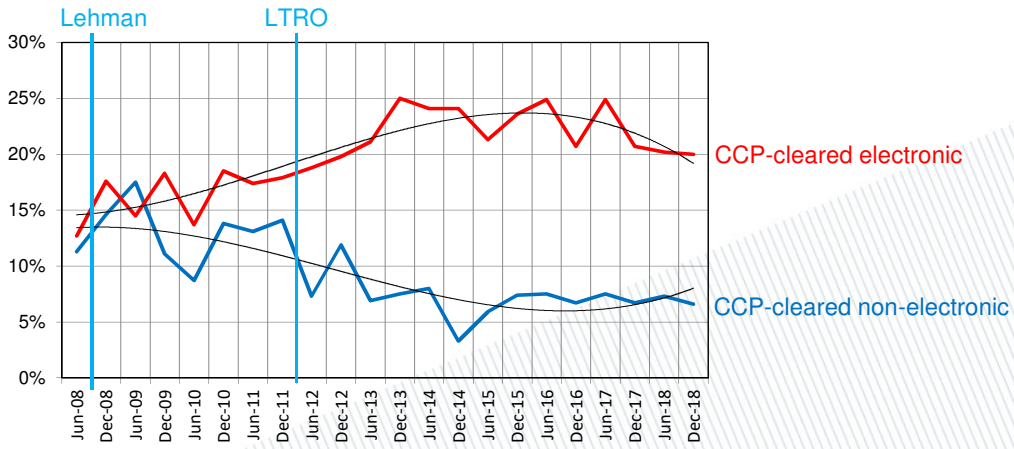
## Geographic Analysis



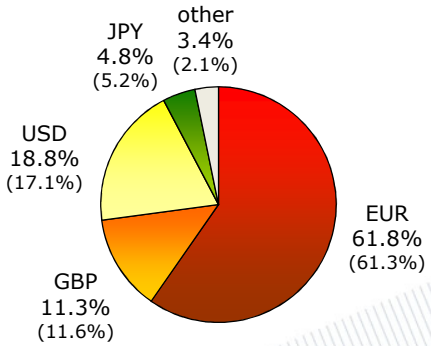





## Business cleared across CCP



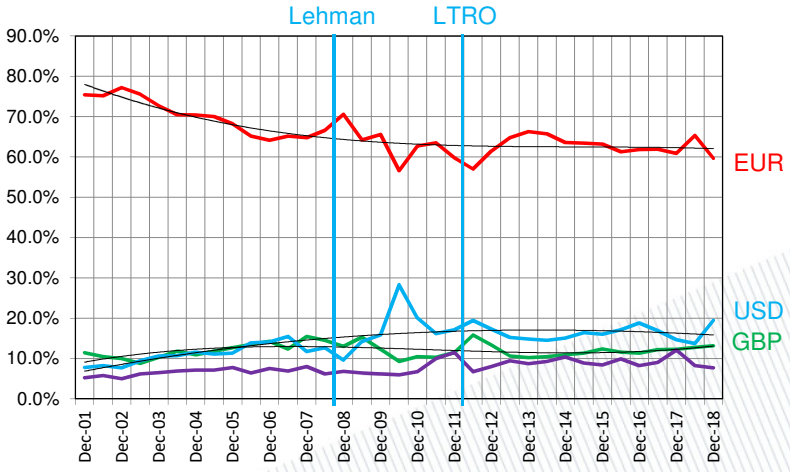
## Currency Analysis



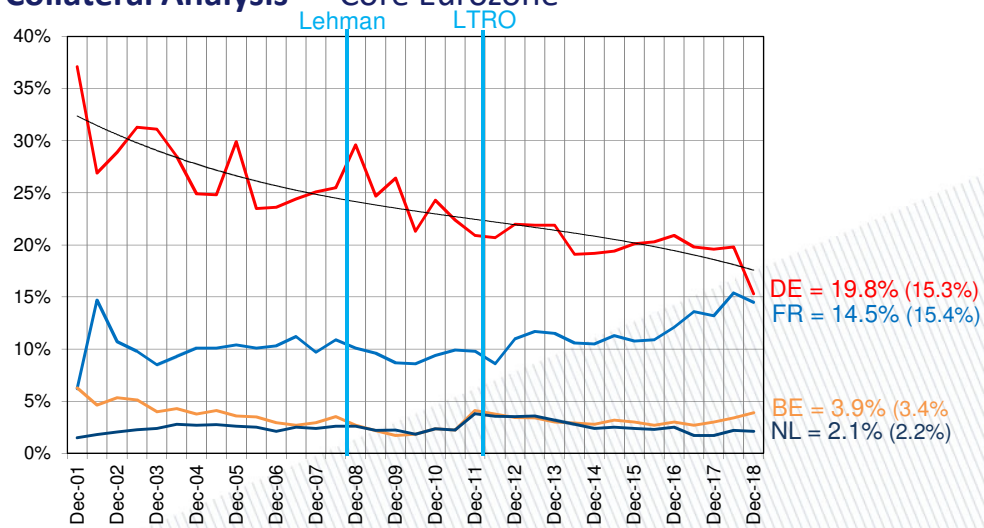





## Currency Analysis



## Collateral Analysis --- Core Eurozone

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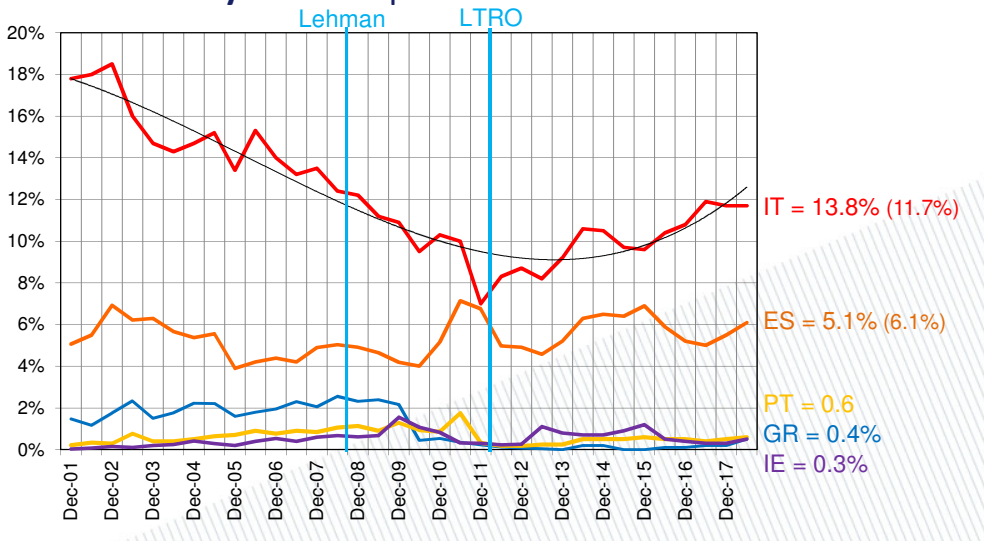
36th European repo market survey conducted in December 2018

## Collateral Analysis --- Peripheral Eurozone

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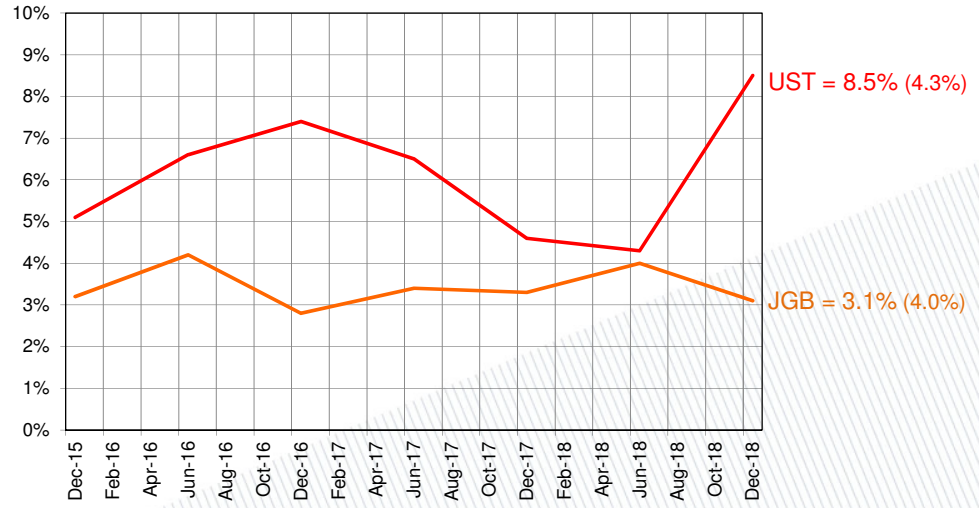
## Collateral Analysis --- non-EU collateral

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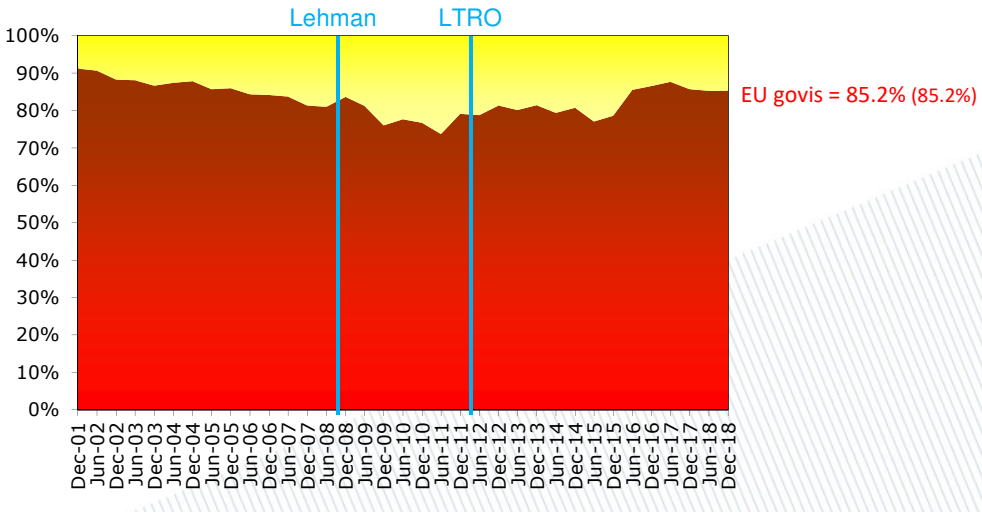
36th European repo market survey conducted in December 2018

## Collateral Analysis

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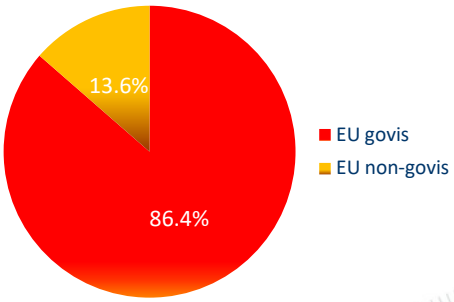
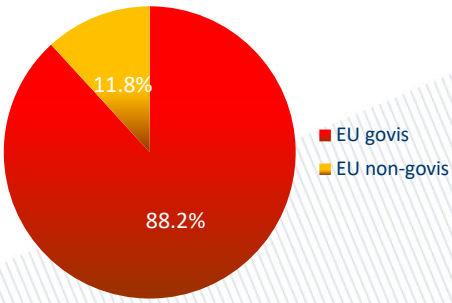
## Collateral Analysis

repo




net borrowing v credit

reverse repo

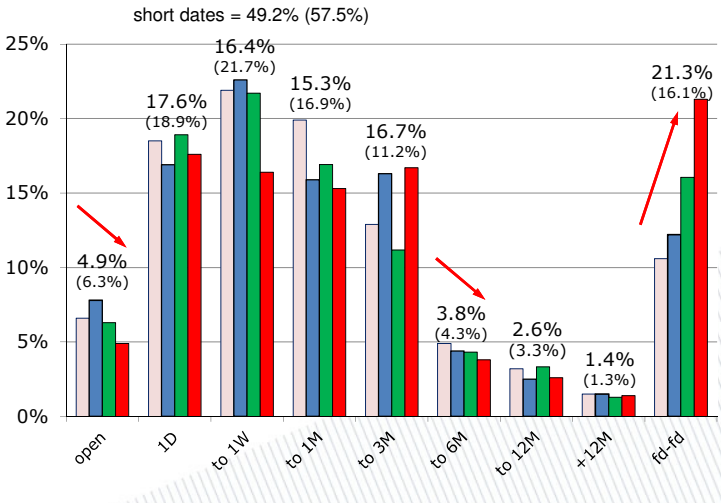



net lending v govis



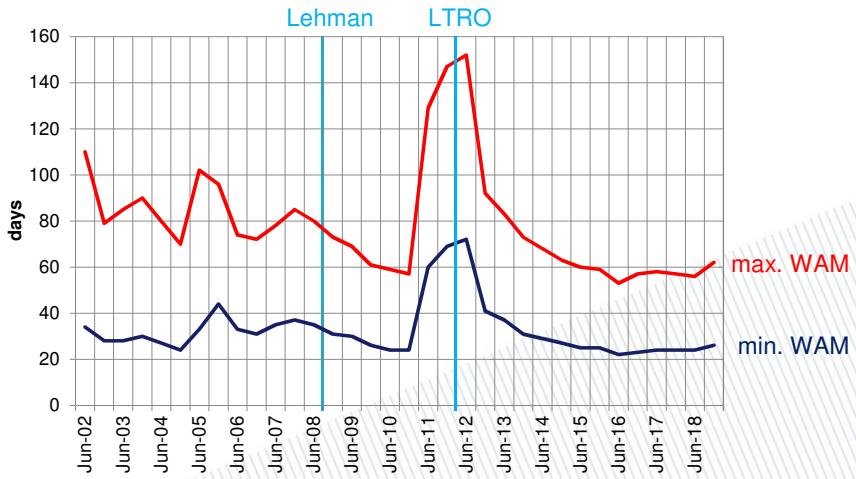


## Maturity Analysis



36th European repo market survey conducted in December 2018

## Maturity Analysis

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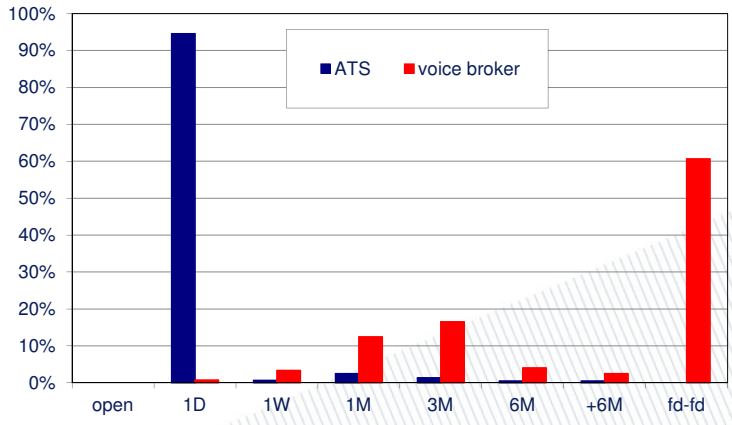
31st European repo market survey conducted in June 2016

## Maturity Comparison

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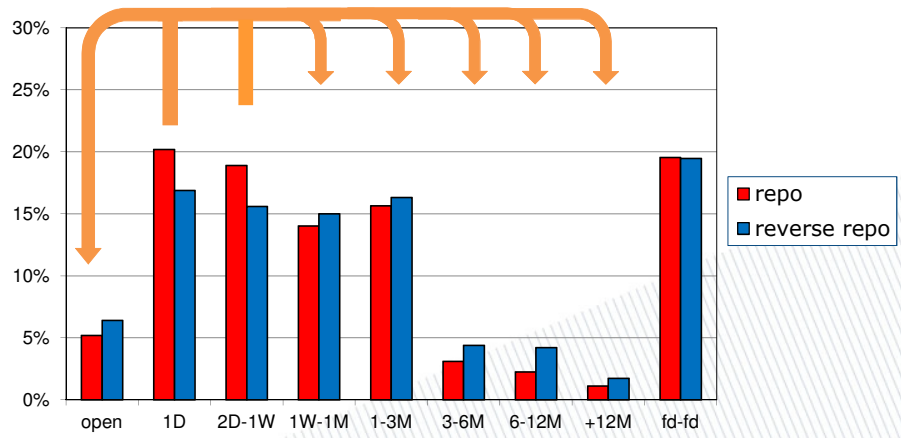
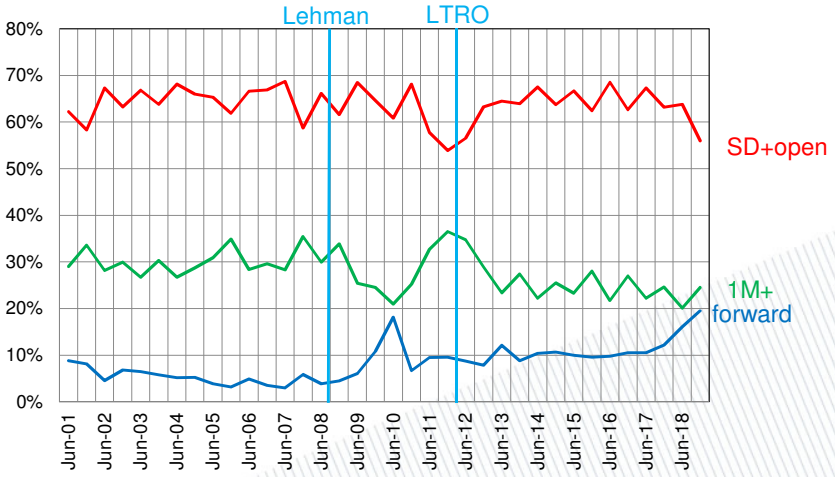
## Maturity Analysis



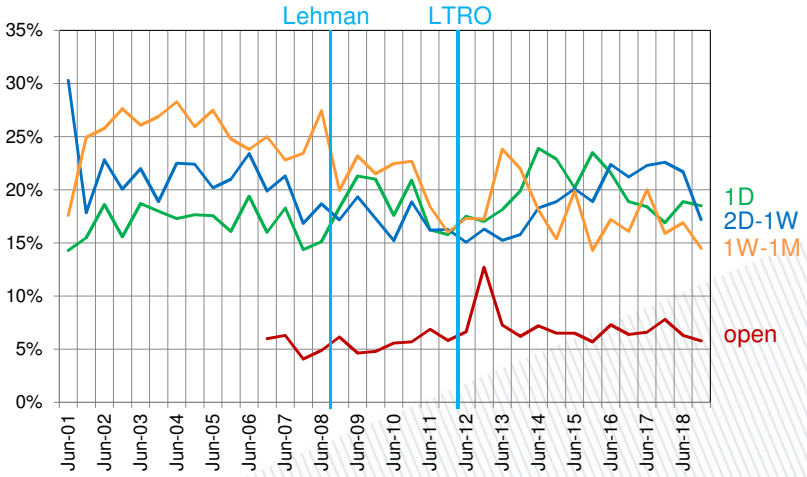





## Maturity Analysis



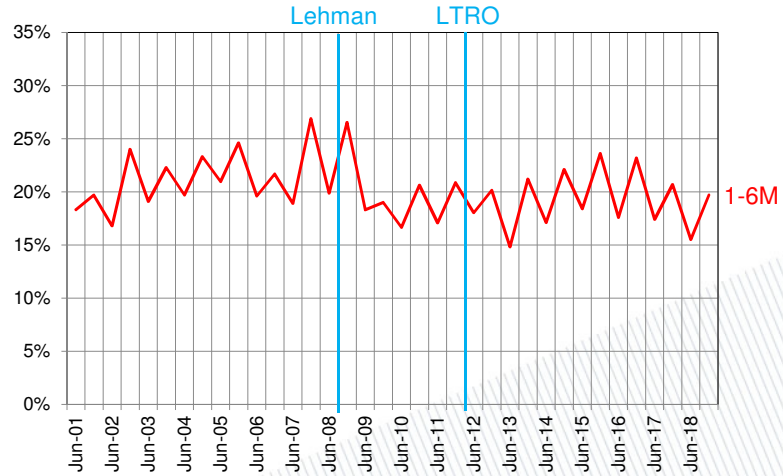
## Maturity Analysis



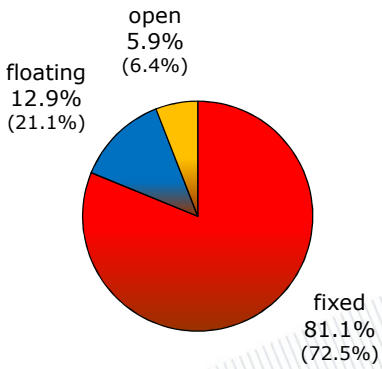





## Maturity Analysis



## Rate Analysis



ICMA Professional Repo Market & Collateral Management Course
Frankfurt 11-12 September 2019

# repo market infrastructure

**Richard Comotto**
ICMA Centre
University of Reading
United Kingdom

ICMA CENTRE THE BUSINESS SCHOOL FOR FINANCIAL MARKETS

1

# repo market infrastructure

## topics

- trading
- clearing
- collateral management
- market configurations
- not covering matching, reporting, payment & settlement

2

# trading

- direct --- telephone or electronic messaging --- one-to-one
  - bilateral collateral management --- between the parties' own back offices
  - tri-party collateral management --- delegated to agent
  - CCP-cleared post-trade --- collateral allocation by member & margining by CCP
- voice-brokered --- telephone or electronic messaging via arranger --- many-to-many price transparency
  - bilateral collateral management --- between the parties' own back offices
  - CCP-cleared post-trade --- collateral allocation by member & margining by CCP
- via interdealer broker (IDB) --- --- telephone or electronic messaging via arranger who also takes matching principal positions --- many-to-many price transparency
  - pre & post-trade anonymity
  - not in European market
- electronic trading --- many-to-many price transparency
  - automated trading system --- platform supports negotiation but requires manual intervention to execute --- only RFQ (request-for-quote) in repo, also called click-to-trade --- order advertized to selected other parties, who independently respond with acceptances, prices or counter-proposals
  - automatic trading system (ATS) --- central limit order book (CLOB) providing automatic execution, also called click-and-trade
    - name display = often called "bilateral" --- pre-trade anonymity only
    - anonymous = CCP-cleared --- pre & post-trade anonymity



# trading

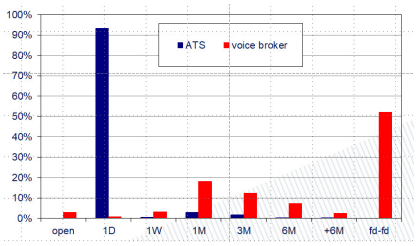
**electronic repo trading** --- in Europe

- automated
  - Bloomberg RPOQ
  - GMLX
  - MTS Repo
  - TradeWeb
- automatic
  - CME/Nex BrokerTec
  - Eurex Repo
  - SENAF
  - SIX Repo
  - tpREPO

# trading

## comparative repo trading profile

| | direct | voice-brokered | electronic trading |
|---|---|---|---|
| **tenor** | includes long term | mainly longer term | mainly very short term |
| **deal size** | includes very large | large | small |
| **forward** | yes | yes | no |
| **structured** | yes | no | no |
| **collateral** | full range | mainly government | government |
| **counterparty** | full range | dealers | dealers |




maturity distribution of ATS & voice-brokered repos
*ICMA European survey, June 2016*

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# clearing

- clearing has traditionally meant settlement/payments/technical netting by custodians/CSDs to reduce settlement flows --- not legally binding in a default
- central (clearing) counterparties (CCPs) clear in the same way --- although "multilaterally" --- but their essential function is to become the buyer to every seller & the seller to every buyer in order to guarantee settlement
- CCPs are associated with OTC markets: in exchange-traded markets, their equivalents are called "clearing houses"

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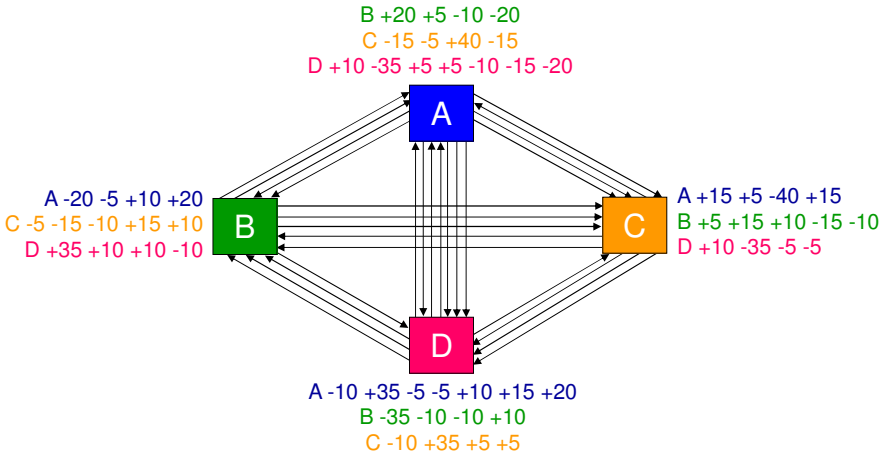
# clearing

- CCP mitigate the risk of their guarantees by:
  - variation margining to eliminate current exposure
  - "multilateral" netting of exposures
- CCP covers residual risk by:
  - taking initial margin from both parties --- if one defaults, defaulter's initial margin may be used to cover cost of replacing/hedging its positions --- defaulter pays
  - taking default fund contributions from both parties --- if one defaults, defaulter's contribution may be used to cover cost of replacing/hedging its positions --- defaulter pays
  - mutualization of risk among members --- if defaulter's initial margin & default fund contribution is inadequate, CCP can tap default fund contributions & commitments of other members --- survivors pay
- CCP offers anonymity of trading



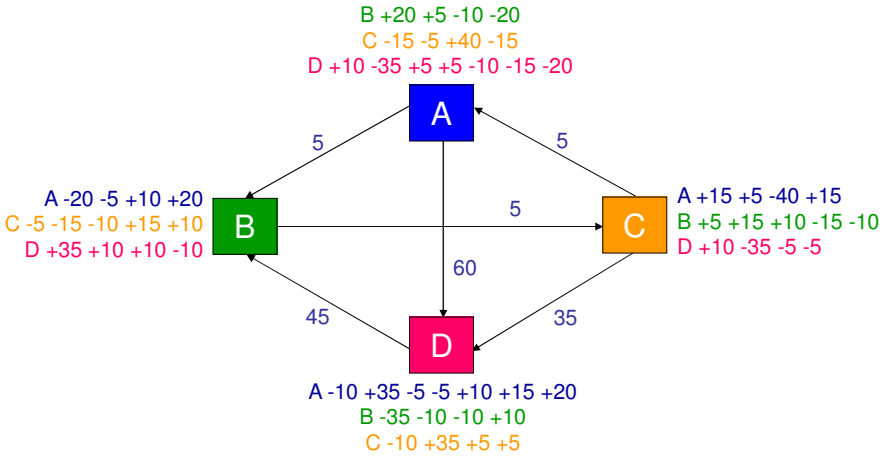
# clearing

## gross settlement



# clearing

## bilateral net settlement

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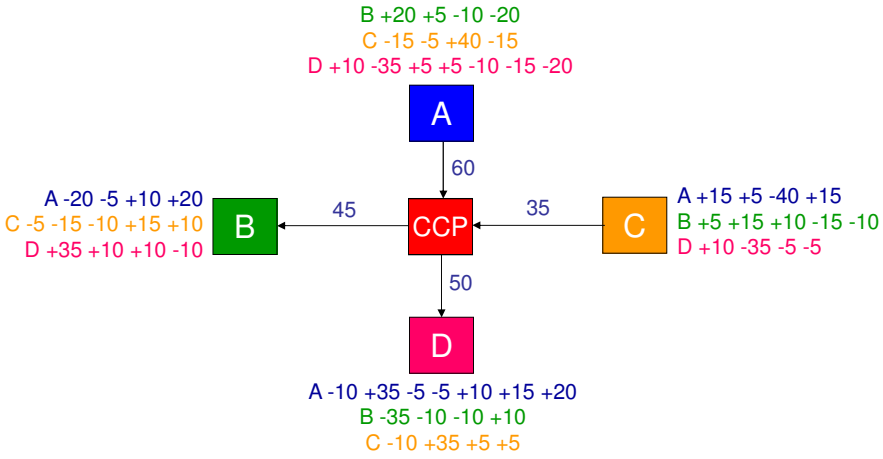
# clearing

## “multilateral” (centralized bilateral) net settlement

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# clearing

- **repo CCPs in Europe**
  - CC&G --- Italy
  - Eurex Clearing
  - KDPW_CCP --- Poland
  - LCH Ltd
  - LCH SA
  - MEFFRepo --- Spain (fixed-income segment of BME Clearing)
  - Nasdaq OMX --- Scandinavia
  - NCC --- Russia
- **repo CCPs in North America**
  - DTCC FICC --- US
  - Canadian Derivatives Clearing Corporation (CDCC)
- **repo CCP in Asia-Pacific**
  - CCIL --- India
  - CSDCC --- China --- not conventional CCP
  - KRX --- Korea
  - JSCC --- Japan

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# clearing

## who trades cleared repos?

- most CCP clearing is of ATS transactions, which are very short-term repos against government bonds --- clearing reduces balance sheet cost of this low-margin business
- there is also post-trade registration of direct & voice-brokered trades
- access to CCPs has traditionally been limited to dealers, as CCP members have been reluctant to mutualize less regulated non-intermediaries
- CCPs will only clear government securities because they can be easily valued (for risk management) & have high turnover (commercially attractive)
- CCPs have been experimenting with client-clearing on ring-fenced basis

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# clearing

## client-clearing

- aim is to reduce balance sheet exposure to clients by bringing them into netting at the CCP
- but clients do not want to mutualize the default risk of CCP members by making default fund contributions/commitments or to perform margining
- clients client is sponsored by a clearing member & cleared transactions may be limited to those with the sponsor
- sponsoring member is ultimately responsible for some or all obligations of client to CCP, usually at least the default fund contribution so client does not participate in mutualization of default risk by members
- sponsoring member may act as operational agent between client & CCP
- client is protected by counterparty's initial margin & default fund contribution to CCP
- CCP is protected from client by sponsors' contributions & risk on client is often reduced by restricting it to cash lending
- restricting clients to lending cash means CCP can increase/decrease collateral from borrower instead of client giving/taking variation margin
- eligibility criteria limit the type of client who can participate



# clearing

## client-clearing facilities

- FICC Sponsored DVP Repo Service
- FICC Centrally-Cleared Institutional Tri-party Service (CCIT)
- Eurex ISA Direct Select Invest --- only net lending by client
- Eurex ISA Direct Select Finance --- borrowing & lending by client
- LCH --- borrowing & lending by client
- CSCC --- Canada --- government-guaranteed

## collateral management

- bilateral --- by each party in its own back office
- tri-party --- outsourced to third-party agent

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## collateral management --- tri-party

### what is tri-party repo?

- repo settled across accounts at common settlement agent (custodian or (I)CSD), who selects, holds & manages the collateral on behalf of buyer over the life of a transaction
- tri-party agent does not provide trading venue
- legal form of repo is a repurchase transaction --- tri-party repo is not an alternative form of repo to repurchase transactions & buy/sell-backs

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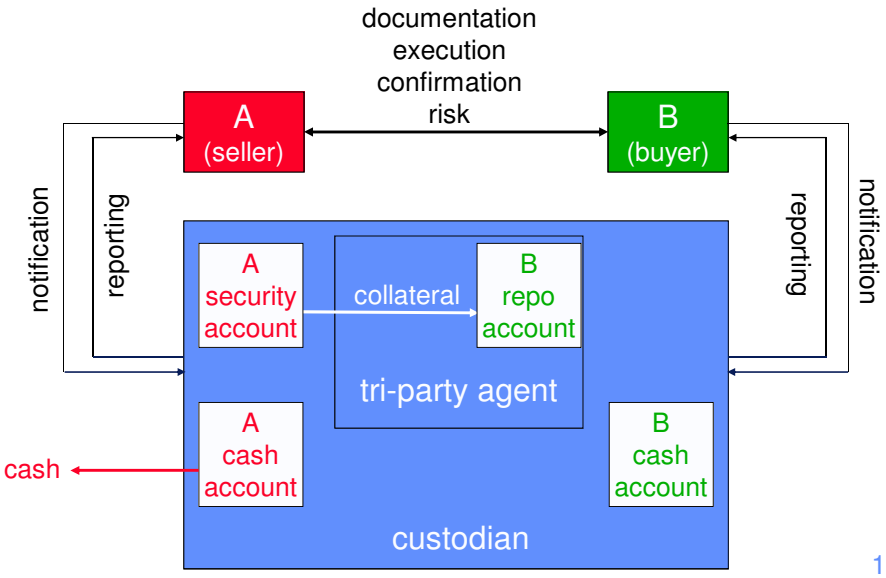
# collateral management --- tri-party

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# collateral management --- tri-party

- triparty repo is alternative to:
  - delivery repo --- incurs settlement costs but ensures buyer has control & possession of collateral --- safe but expensive
  - hold-in-custody (HIC) repo --- no settlement costs but buyer does not have control & possession of collateral --- risky but cheap
- because triparty repo delegates collateral management to common custodial agent:
  - settlement is across the books of the agent, not across the securities settlement system --- no settlement cost as in HIC repo
  - buyer gets control & possession of collateral --- safe as in delivery repo
- offers GC or basket trading
  - bespoke baskets for directly-negotiated transactions
  - standard ATS/CCP-prescribed baskets for electronically-traded transactions

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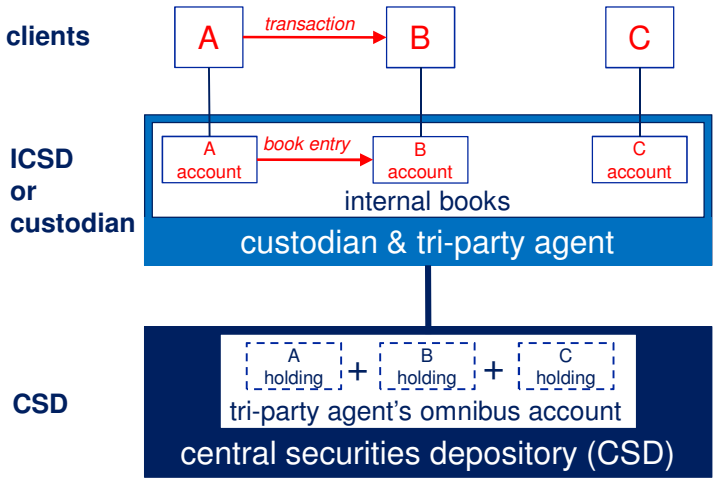
# collateral management --- tri-party

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# collateral management --- tri-party

- in addition to custody & settlement, tri-party agent provides an outsourced back office to the parties
- transaction & collateral selection
  - auto-allocation --- collateral selection & transaction prioritization usually by agent or client algorithm across repo or all tri-party products
  - pre-agreed collateral profile = eligibility criteria + limits + initial margins
- on-going collateral optimization & substitution
- valuation & margining --- usually of transaction exposures
- management of corporate events & income payments

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# collateral management --- tri-party

## Europe

- Euroclear --- market leader in fixed income
- Clearstream --- strong domestic German position
- BoNY Mellon --- equity & relationship with Goldman
- JP Morgan --- equity
- Citigroup --- Italian government bonds
- SIS --- Swiss market
- NSD --- Russia
- Iberclear --- Spain
- KDPW --- Poland
- Monte Titoli --- Italian market

- **US**
  - BoNY Mellon (JP Morgan withdrew in 2018)
- **Asia-Pacific**
  - ASX Collateral --- Australia
  - KSW --- Korea
  - SHCH --- China --- not conventional tri-party facility





# collateral management --- tri-party

## who trades tri-party repos?

- tri-party repo is typically dealer versus risk-averse cash investor
- preferred route into repo market for non-dealers
- preferred route into repo market for credit collateral
- because collateral is selected by agent, not the parties, tri-party repo is purely cash-driven = GC repo market
- collateral selected for each repo typically consists of multiple issues, often multi-currency
- tri-party deal size typically larger than normal --- easy to assemble large baskets of eligible collateral

# collateral management --- tri-party

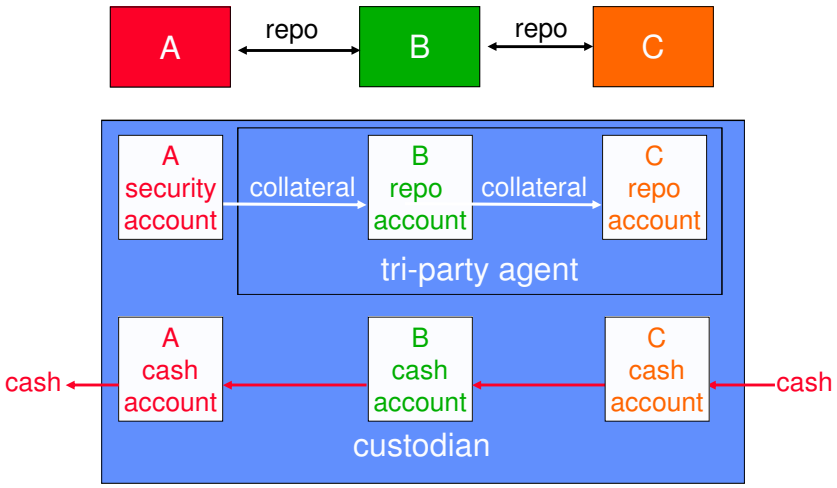
- tri-party agent does not generally allow re-use of collateral, as collateral is automatically selected by agent, who may select a security as collateral which seller sells off in cash market, so agent needs to be able to retrieve securities by means of substitution
- inability to re-use could create re-characterization risk, so agents allow it in theory but would withdraw from collateral management
- inability to re-use creates regulatory problem in that a tri-party reverse repo would cease to hedge liquidity risk of buyer, so agents have introduced internalized re-use facility





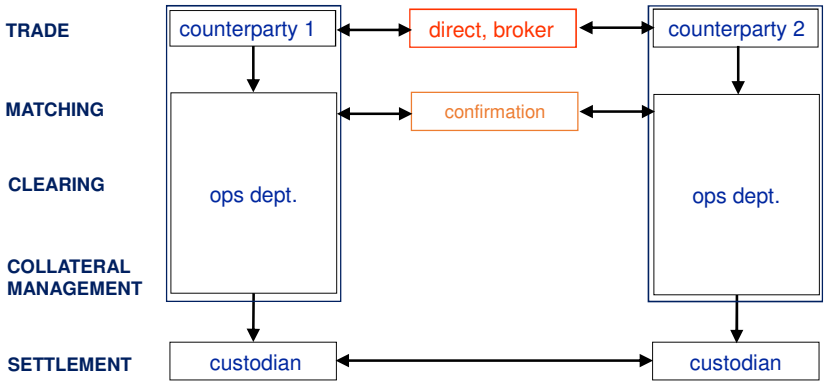
# collateral management --- tri-party

## collateral re-use facility



# market configurations

## traditional OTC (bilaterally-negotiated uncleared)

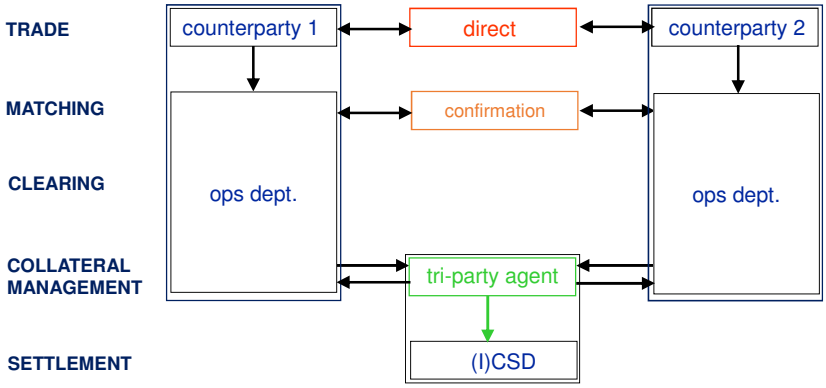






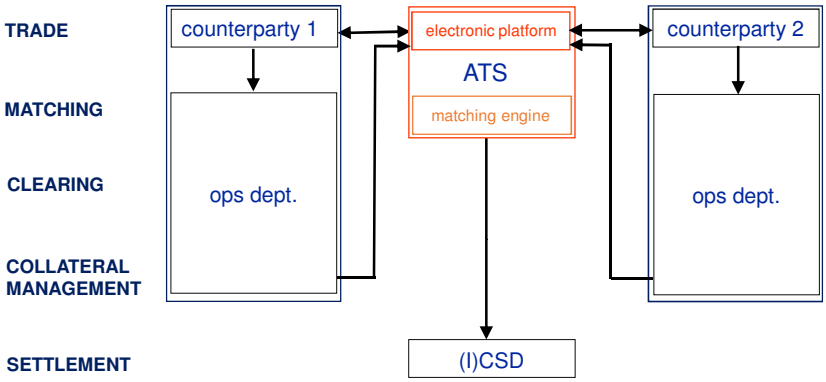

# market configurations

## traditional tri-party (bilaterally-negotiated uncleared tri-party)



# market configurations

## 'bilateral' electronic (electronically-negotiated uncleared)

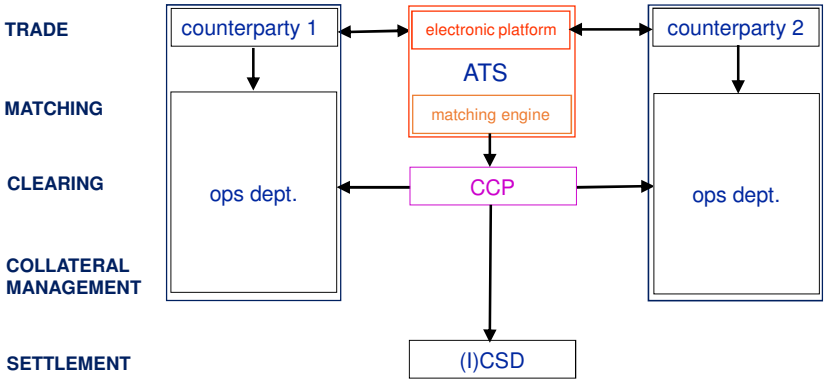






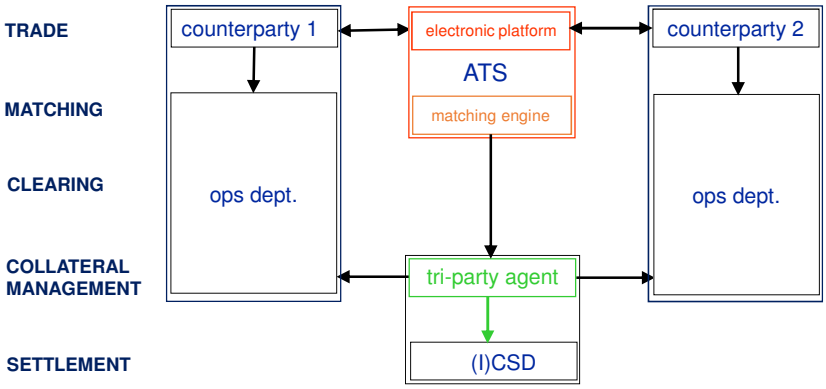

# market configurations

## anonymous electronic (electronically-negotiated cleared)



# market configurations

## electronic tri-party (electronically-negotiated uncleared tri-party)

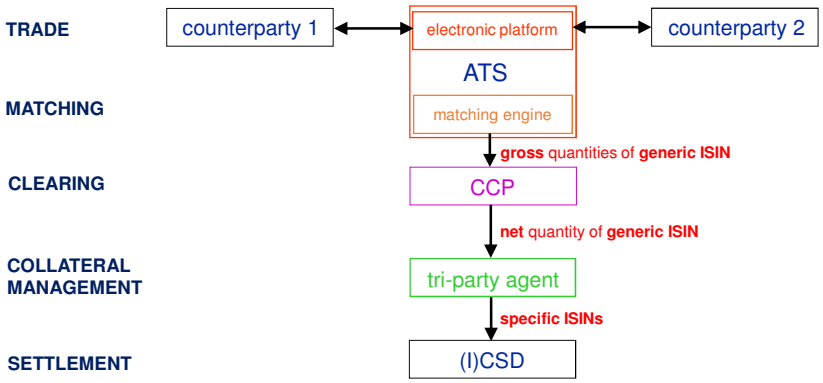






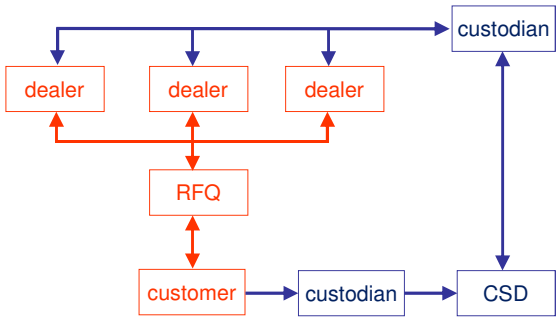

# market configurations

## GC financing (electronically-negotiated cleared tri-party)



# market configurations

## B2C multilateral electronic dealing



International Capital Market Association

**ICMA Professional Repo Market & Collateral Management Course**
**Frankfurt 11-12 September 2019**

# margin

**Richard Comotto**
ICMA Centre
University of Reading
United Kingdom

ICMA CENTRE THE BUSINESS SCHOOL FOR FINANCIAL MARKETS

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## margin

**topics**

- initial margin & haircut
- variation margin



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# initial margin & haircut

## what are initial margins & haircuts

- initial margins & haircuts are types of risk adjustment to the market value of collateral to fix a prudent purchase price that takes account of potential future losses that might be suffered during the liquidation after a default of the total holding of collateral from a defaulting counterparty, possibly in stressed market conditions

  market value – initial margin/haircut = purchase price



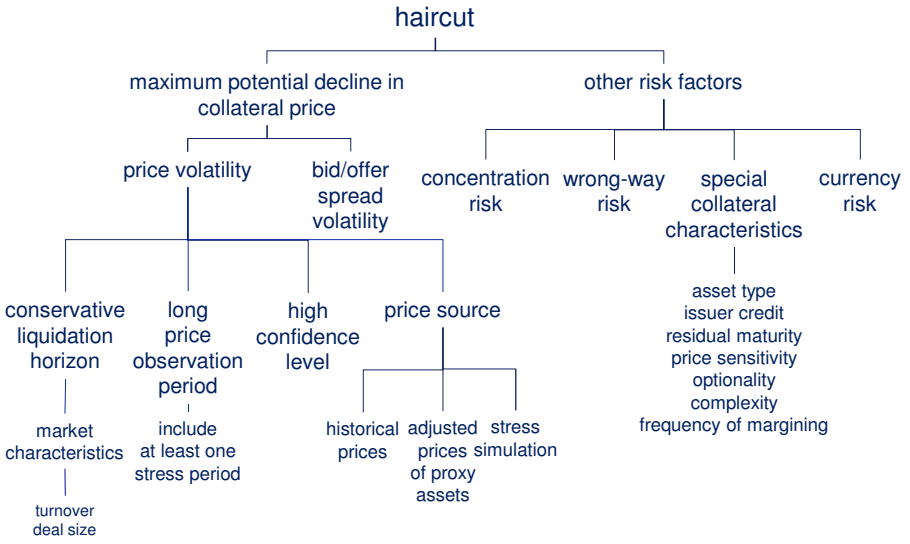
# initial margin & haircut

## what are initial margins & haircuts

- initial margins & haircuts should reflect:
  - collateral liquidation losses after a default
    - volatility of the price of collateral & exchange rates over the assumed liquidation period
    - potential market impact of liquidation sales
    - size of the holding of the same collateral
  - certain credit risks
    - wrong-way risk (correlation between counterparty & collateral credit risk)
    - credit risk of the issuer of collateral
  - operational & legal risks
    - frequency of variation margining & length of margin delivery period
    - potential for legal obstruction to liquidation
    - risk to certainty of title transfer of collateral & variation margins
- FSB recommended
  - minimum haircuts on non-CCP SFT against non-government securities with less-regulated entities --- to reduce rate & pro-cyclicality of leverage
  - minimum standards for haircut calculation methodologies
  - delayed for two years

# initial margin & haircut

## FSB haircut model






# initial margin & haircut

## what are initial margins & haircuts

- what about credit risk of repo counterparty?
  - in theory, it should be priced into repo rate
  - in practice, weak correlation observed between haircuts & counterparty credit risk (CGFS 2010) but could be:
    - correlation of counterparty credit risk & market risk
    - wrong-way risk
    - tendency for riskier counterparties to be commercially weaker

# initial margin & haircut

## what are initial margins & haircuts

- most common method for quantitatively estimating government & high grade collateral is VaR model
  - 'risk-free' haircuts estimated for each asset type, varied by concentration limit
  - add-ons for wrong-way risk
- liquidity proxied by holding/liquidation period
- long observation periods & inclusion of past stress episode(s) to address pro-cyclicality
- models are simplifications generating base numbers which require qualitative adjustments
- more qualitative approach necessary for credit collateral because of poorer price series
- many dealers & some ATS use central bank haircuts



# initial margin & haircut

## what are initial margins & haircuts

- haircuts are just one of a set of risk management tools, which include:
  - capital allocation
  - repo rate
  - collateral eligibility criteria
  - credit limits
  - variation margining
- there are also trade-offs within the set to allow repos to be customized to particular commercial & other circumstances, eg some counterparties wish/need to give a lower haircut in exchange for a higher repo rate & vice versa

# initial margin & haircut

## what are initial margins & haircuts

- initial margins & haircuts are usually over-collateralisation in favour of the buyer but under-collateralisation is possible in favour of high-quality sellers
- any initial margin/haircut given by a seller has to be financed from unsecured debt or own funds, so adds to the total cost of financing collateral



# initial margin & haircut

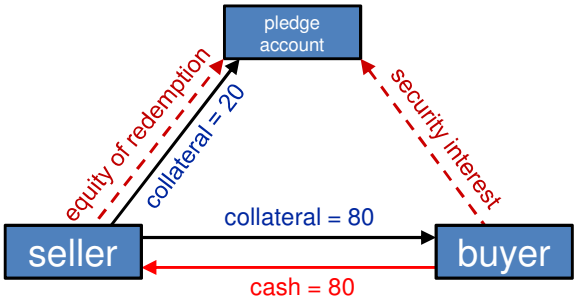
## initial margins & haircuts are risky

- giving an initial margin/haircut  is an unsecured credit risk
- deep haircuts may encourage parties to 'cut and run' early, leading to pre-default fire sales (Duffie)
- haircuts may increase risk of post-default fire sales by providing 'reservation price' --- not suitable as macro-prudential tool (Begalle et al)

# initial margin & haircut

## initial margins & haircuts are risky

•haircuts expose other party to unsecured credit risk (note Russian defaults by buyers with large haircuts)
•market has been exploring use of pledges, pledge-backs, trusts, escrows, etc, to reduce risk to haircut-giver
•Euroclear initial margin service

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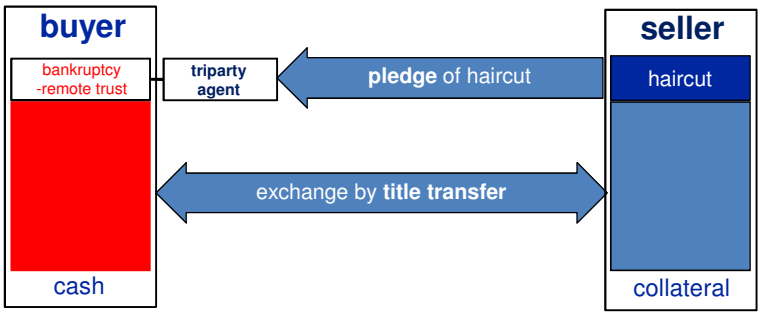
# initial margin & haircut

## initial margins & haircuts are risky

•project to reduce RWA of dealers giving haircuts to high-RWA buy-side cash-lenders
•using bankruptcy-remote trust mechanism introduced by BCBS Margin Requirements for pledged initial margin for non-centrally derivatives (March 2013)
•pledged-haircut supplement to GMRA being drafted

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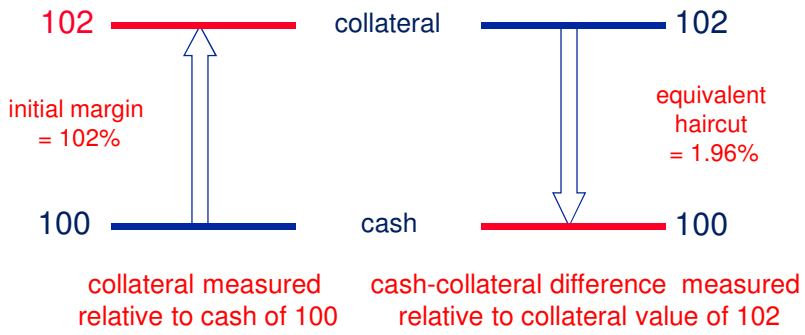
# initial margin & haircut

## initial margin v haircut

- initial margin/haircut are alternative ways of expressing the agreed ratio of cash to collateral:
  - initial margin --- market value of collateral expressed as a percentage of the cash
  - haircut --- cash is expressed as a discount to the market value of collateral








# initial margin & haircut

## **initial margin** (called Margin Ratio in GMRA)

$$\text{Margin Ratio} = \frac{\text{Market Value of Purchased Securities on Purchase Date}}{\text{Purchase Price}} 100$$

$$\text{Margin Ratio} = \frac{102}{100} 100 = 102\%$$

# initial margin & haircut

**haircut** (introduced in GMRA 2011)

$$\text{haircut} = \frac{\text{Market Value of collateral on Purchase Date} - \text{Purchase Price}}{\text{Market Value of collateral on Purchase Date}}$$

$$\text{haircut} = \frac{102 - 100}{102} = 1.96\%$$

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# haircuts

**ERCC study** (2016)

- haircuts on high-quality collateral driven primarily by credit risk of collateral issuer & market risk
- greater consensus on haircuts on high-quality collateral, in part, due to lower levels
- haircuts imposed by local dealers diverge from international dealers
- eligibility criteria & concentration limits are more important in credit repo; add-ons less important
- cross-sectional haircut ranges are wider for credit collateral --- wider differences in risk management capabilities & wider range of risk management measures

# initial margin & haircut

## haircuts in Europe on uncleared repos

- no haircuts for
  - most interdealer OTC repos against high-quality government securities
  - repos with prime customers against high-quality government securities
- selective haircuts for
  - interdealer repos against lower-quality securities
  - repos with prime customers against lower-quality securities
  - non-prime customers against any collateral
- always haircuts for
  - tri-party repo
  - structured & term repos



# initial margin & haircut

## haircuts on CCP-cleared repos

- "haircuts" imposed by CCPs are actually initial margin deposits against net positions (CCPs impose true haircuts on any non-cash collateral given as initial margin) --- initial margin for CCP is not the same as initial margin in GMRA
- CCP positions change daily & initial margins can be changed by CCP at any time (unlike bilateral repos) so greater risk of pro-cyclicality
- CCPs rely more on "haircuts" (initial margin) than uncleared parties because they cannot use credit limits

# variation margin

## what is variation margining

- variation margining is the repeated realignment of the market value of collateral & the amount of cash that is owed in order to restore any initial margin/haircut
- variation margining in the GMRA is called Margin Maintenance
- variation margining is a two-way process (both buyer & seller are liable)
- GMRA provides little-used alternatives to variation margining --- designed for but not limited to buy/sell-backs --- in the form of the early termination of a repo & its replacement with a new transaction for the remaining term to maturity that brings:
  - cash into line with the current market value of the collateral --- Repricing
  - market value of the collateral into line with the cash that is owed --- Adjustment

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# variation margin

## what can be given as margin?

- GMRA allows cash or securities or both
- parties can pre-agree to restrict what is eligible as margin
- if cash is given, unless agreed otherwise, this must be in the pre-agreed Base Currency & cannot be refused
- interest has to be paid on cash variation margin --- the rate should be pre-agreed & it is most appropriate to use an overnight rate
- securities offered as variation margin do not have to be the same as those given as collateral in the underlying repos
- if securities are offered as variation margin, unless agreed otherwise, they must be “reasonably acceptable” to the margin-caller --- can give rise to disputes
- margin-caller has the right to ask for variation margin to be sourced from variation margin previously given to the other party
- otherwise, the choice of what is given as variation margin goes to the party receiving the margin call

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# variation margin

## when can margin be called?

- margin calls are one of the few communications between parties which do not have to be in writing (but any phone call is best followed up by something in writing)
- if you do not call for variation margin when entitled to do so, you do not lose your right to do so later
- parties has no obligations to prompt each other party to make a margin call
- variation margin can be called by whichever of the parties has a Net Exposure
- Net Exposure consists of:
  - aggregate of the Transaction Exposures of all the repos under the same GMRA plus
  - any unpaid manufactured payments & (if parties can pre-agree) any future manufactured payments due before the margin delivery deadline
    minus
  - Net Margin --- the excess of margin held by one of the parties

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# variation margin

## what is a Transaction Exposure?

- Transaction Exposure is the difference between the amount of cash owed on the date of calculation adjusted by any agreed initial margin & the latest Market Value of the collateral adjusted by any agreed haircut

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# variation margin

## what is a Transaction Exposure?

- if a repo has an initial margin:

Transaction Exposure = (RP x IM) – MV

$= (\underbrace{101}_{RP} \times \underbrace{102\%}_{IM}) - \underbrace{99}_{MV} = \underbrace{4.02}_{TX}$ (103.02)

RP = repurchase price on day of calculation
IM = initial margin
MV = market value of collateral

RP = 101
IM = 102%
MV = 99

(RP x IM) = market value of the collateral needed to hedge the amount of cash currently owed: formula compares this with the actual market value of the collateral

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# variation margin

## what is a Transaction Exposure?

- if a repo has a haircut:

Transaction Exposure = RP - (MV x (1 – H))

$= \underbrace{101}_{RP} - (\underbrace{99}_{MV} \times (1 - \underbrace{1.96\%}_{H})) = \underbrace{3.94}_{TX}$ (97.06)

RP = repurchase price on day of calculation
MV = market value of collateral
H = haircut

RP = 101
IM = 102%
MV = 99

(MV x (1 – H)) = maximum amount of the cash owed that is fully collateralized given the current market value of the collateral: formula compares this with the actual amount of cash owed at the time of calculation

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# variation margin

## how the GMRA calculates the Net Exposure

| | your exposure to me | my exposure to you |
|---|---|---|
| Transaction Exposure of repo 1 | 0.772 | |
| Transaction Exposure of repo 2 | | 0.359 |
| Transaction Exposure of repo 3 | 0.053 | |
| aggregate Transaction Exposure | 0.825 | 0.359 |
| manufactured payments due | | +0.475 |
| net margin | | -0.150 |
| gross exposures | 0.825 | 0.684 |
| Net Exposure | 0.141 | |

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# variation margin

## when are margins returned?

- while most repos are separately collateralized, variation margin is calculated for all the repos under the same GMRA
- as variation margin is not attributed to any individual repo, when a repo matures, there is no automatic return of variation margins
- instead, variation margins are returned when a party making a new margin call exercises his right to ask for that margin to be sourced from margin previously given to the other party

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# variation margin

## what is Net Margin?

- because:
  - the choice of margin goes to the party receiving a margin call unless the margin-caller exercises his right to ask for that margin to be sourced from variation margin previously given to the other party;
  - cash or different security issues can be provided as variation margin

  parties can give each other variation margin in the form of different assets & both can accumulate margin holdings --- for example:
  - on day 1, party A gives 15 of security X as variation margin to party B
  - on day 2, party A gives 5 of cash as variation margin to party B
  - on day 3, party B gives 7 of security Y as variation margin to party A
  - on day 4, party B gives 4 of cash & 2 of security Z as variation margin to party A
  - party A ends up with 7 of Y, 2 of Z & 4 of cash, totalling 13
  - party B ends up with 15 of X and 5 of cash, totalling 20
  - party B has a Net Margin of 7 but both parties are wasting 13 of margin each
- only the difference between margin holdings --- the Net Margin --- affects the Net Exposure; offsetting margins are wasted
- to avoid wasting margin, call back variation margin previously given to another party whenever making a new margin call





# variation margin

## what price is used to calculate margin?

- international market practice is to calculate the Market Value of collateral using a mid price at close of business on the previous business day
  - mid price is seen as reasonable to both parties assuming neither party is more likely to default than the other
  - a price from the previous business day is used as this allows time to access the price (but a current intra-day price will be used where there have been exceptional price movements during the day)
  - a price is taken at close of business as this is a neutral time
- unless there is an accepted external price source, an internal price is provided by the margin-caller
- if the other party disputes the caller's internal price, a market quote or source of quotes has to be agreed
- GMRA says accrued interest should be up to date of calculation but market practice is to include accrued interest up to the date of delivery of the variation margin

# variation margin

## reducing the operational burden of variation margining

- variation margin can be limited to material changes in Net Exposure --- in excess of a pre-agreed reciprocal amount called exposure threshold or minimum transfer amount (MTA)
- when Net Exposure touches/exceeds the threshold, variation margin should eliminate the whole exposure (different to use of exposure threshold/MTA in derivatives)
- size of the exposure threshold/MTA should be a trade-off with the operational cost of variation margining
- no provision for exposure threshold/MTA in the GMRA but it is often written into Annex I as a supplementary term
- may be better practice to consider a "soft" exposure threshold/MTA (an undocumented informal agreement not recorded in the GMRA)
- include use of exposure threshold/MTA in unsecured credit limits

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# variation margin

## managing margin disputes

- what happens if the party receiving a margin call disagrees with the amount?
- there is no dispute resolution procedure in the GMRA
- although failure to meet a margin call is an event of default, it is doubtful that failure to meet an incorrect margin call would be so considered
- if a party argues that a margin call is too large, it should give the amount it agrees with & argue about the difference
- parties should have documented policies & procedures in place to respond efficiently to variation margin queries
- ask problem counterparties to explain how & when they calculate Net Exposure, what sources they use & what assumptions they makes about accrued interest, etc
- management should monitor frequency, duration & size of margin call disputes per counterparty & overall in order to identify risky counterparties & internal operational weaknesses
- frequent & protracted margin disputes may attract regulatory sanctions

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# variation margin

## best practice

- agree deadlines for making a margin call
- agree deadlines for party receiving a call to propose what is to be given as variation margin & pre-agree acceptable margin if possible
- pre-agree interest rate to be paid on cash margin & when it will be paid
- have documented policies & procedures in place to respond efficiently to margin queries; understand counterparties' calculation methodology; monitor margin disputes

ICMA

International Capital Market Association

# Speaker Biography

| | |
|---|---|
| **Name:** | **Kevin Rettberg** |
| **Job title:** | **Trader – Default Management** |
| **Company:** | **Eurex Clearing AG** |

Kevin is a Repo and Bond Trader in the Default Management team of Eurex Clearing and the Risk Department's point of contact for repo matters. Should a clearing member of Eurex Clearing default, he is responsible to hedge and liquidate the bond and repo exposure of the CCP. In the time between defaults Kevin is working on further developing the default management process for repos, as well as assuring and testing operational readiness. In his role as point of contact he also works closely together with Eurex Repo.

Before his time at Eurex Clearing, Kevin was a Repo Trader at Commerzbank, where he first traded to manage the short-term liquidity and liquidity ratios of the bank and after the start of QE, focused on market making in government bond specials to serve the client franchise.

# CCP: Margining and Default Management

## ICMA Workshop: Professional repo and collateral management

Kevin Rettberg, Eurex Clearing AG

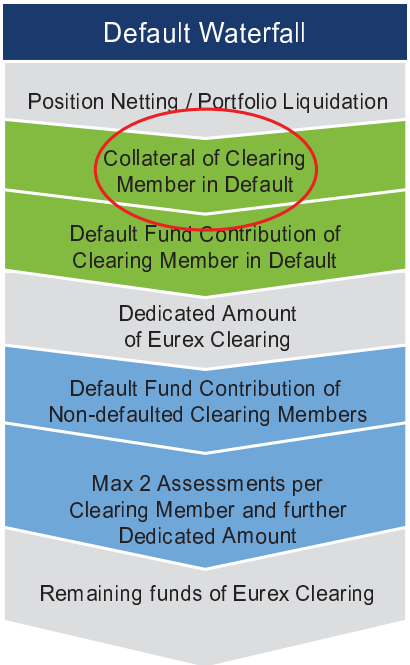
September 2019



# CCP Lines of Defense: Why margining is important

## Eurex Clearing's default waterfall

- Eurex Clearing provides a multi-level security system
  - First the **collateral and the default fund contribution of the member in default** are utilized.
  - After the defaulter's contributions are exhausted, an assigned **dedicated amount of Eurex Clearing is applied**, before **non-defaulting clearing members' default fund contributions**, and **remaining capital of Eurex Clearing** are used.
- Each clearing member's contribution to the default fund is based on a minimum contribution and a dynamic component, accounting for the individual clearing member's risk situation.
- Following a realization of any default fund contributions of non-defaulted clearing members, such clearing members are asked to provide assessments to their contributions. Simultaneously **Eurex Clearing will provide the further dedicated amount**.
- **Clearing members' total liability is limited** as they have to provide a maximum of two assessments per capped period.



# Margin Parameters / Initial Margin

**Margin Parameters determine the Initial Margin**

- Forward looking measure to cover potential adverse market movements between member default and liquidation as well as cost of liquidation (bid-ask-spread)
- Calculation basis for Eurex Clearing is an assumed holding period of 2 days for bonds. I.e. Initial Margin has to cover market movements of 2 days with a 99% confidence intervall.
- Parameter mainly depends on:
  - Interest Rate Risk
  - Credit Risk
  - Liquidity Risk

**Calculation of IM:**

- Margin Parameter * Market Value of Deal Collateral





# Variation Margin

**Variation Margin**

- Backward looking measure to cover market movements since inception of the trade
  For Repo: Change in value of the underlying deal securities
- E.g. if bond price rises, cash provider has to pay VM

**VM Future**

- Has to be paid in cash
- Will be paid out if position moves up

**VM Repo**

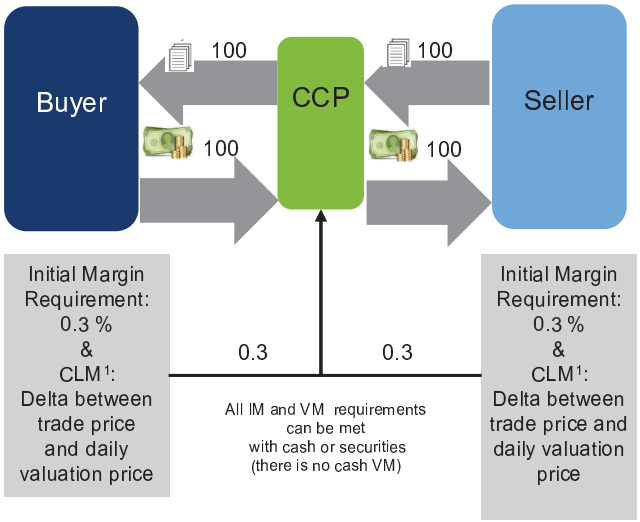
- Can be paid in cash or as securities pledge
- Will not be paid out if position moves up
  i.e. cash taker will not receive additional cash if bond price moves up

# Risk Management – Repo Margin Calculation - Overview

## Margin Calculation for Repo Transactions (simplified; after settlement of the front leg)

### Special Repo / GC Repo

- DE0001135390
- Notional 100.000.000
- Price 100%
- Margin Parameter: 0.3%




For clearing purposes, no differentiation between special repo and gc repo. After allocation gc trade becomes a special trade.

- Settlement DVP in CBF, CBL or Euroclear Bank



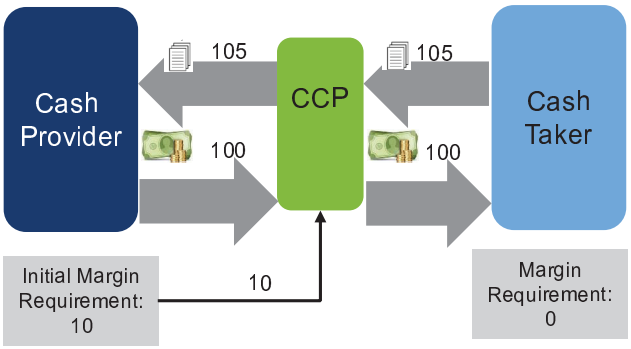


# Risk Management – Repo Margin Calculation - Overview

## Special Case: GC Pooling

### GC Pooling

- GC Pooling ECB Basket
- Notional EUR 100.000.000
- Weighted Haircut 5%




- Collateral managed in Xemac / CmaX while only the net exposure per Basket and Currency is collateralized
- Collateral can be re-used for other GC Pooling transactions and for pledges towards Eurex Clearing, Deutsche Bundesbank or Banque Centrale du Luxembourg
- Daily Mark-to-Market incl. re-allocation
- Real-time Substitutions possible

# How to pay Margin

- Cash

- Securities
  Eligible securities are pledged to the CCP
  highest credit quality and liquidity

- Triparty re-use
  Example Eurex Clearing: Deal collateral from GC Pooling baskets can be used to cover initial margin requirements towards Eurex Clearing.
  Advantages:
  - No additional liquidity resources consumed for cash provider
  - Cost efficient way of posting margin





# Default management process reflects best practice and complies with market requirements and regulatory guidelines

## Overview of default management process


- To protect client assets, positions and collateral are transferred wherever possible
- Portfolio and market evaluation in preparation of liquidation
- Special treatment of positions where front leg is due to settle / has not settled yet

- If necessary, **hedging** of the defaulted clearing member's portfolio is executed as early as possible, to limit losses immediately
- Hedging is done via liquid futures
- Focus on DV01

- All positions are intended to be liquidated via **bilateral trades**
- Mutual default fund will not be utilised, unless all clearing members have the chance to provide a price in the auction

- Only if an independent sale is unsuccessful, remaining ISINs may be liquidated via **auctions**
- Participation is binding only for those clearing members who are capable from an operational and risk perspective to process the respective ISIN
- Clients are allowed to participate via their clearing member
- Default fund juniorisation and penalty fee set incentives for competitive bidding

# Determination of hedging strategies

## Hedges are used to minimize market risk

- **Hedging** will in general be performed **by the use of Eurex listed derivatives** (e.g. BUND, BOBL, OAT Futures).
- **The ability to hedge bonds lower rated** than A+, as corporate bonds and unsecured bank bonds with the existing set of futures **is limited** and only possible in coincidental situations.
- **Derivatives hedges will in general be liquidated jointly with the bonds** and repo transactions as basis trades.
- The decision on what futures to use as hedge can be guided by the following matrix:

| Bond / Issuer Type | High Quality (AAA to AA-) | Medium Quality (A+ to BBB-) | Low Quality / unrated (worse than BBB-) |
|---|---|---|---|
| Sovereign | Hedging possible with BUND or OAT | Hedging unlikely to be possible / effective. Potential hedge partly with BTP Future. | |
| Supranational, Agency, Local Government | | | |
| Covered and Government Guaranteed | | | |
| Corporate Bond | | | |
| Unsecured Bank Bond | | | |

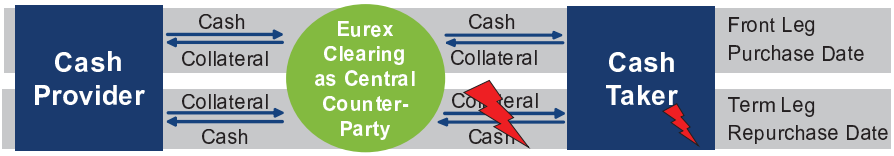




# Two step liquidation needed for repo transactions

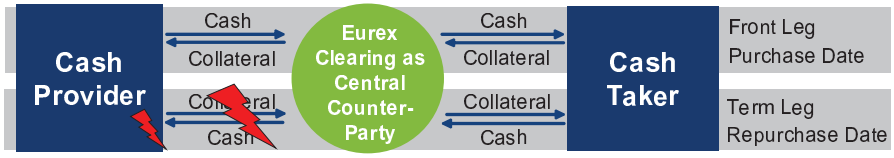
## Overview of general liquidation process

- Due to the product characteristics of repo transactions, the **DMP requires two steps***:
  - the **CCP needs to buy or sell the underlying bond** in the market.
  - the **CCP needs to enter into a repo transaction** replacing the one terminated with the defaulted clearing member.
- Cash taker default in a repo transaction:




If a **cash taker defaults**, Eurex Clearing **acts as cash provider/ collateral taker in the frontleg** of the replacement repo (performing a 'reverse repo'), **and sells the underlying bond** in the markets.

- Cash provider default in a repo transaction:



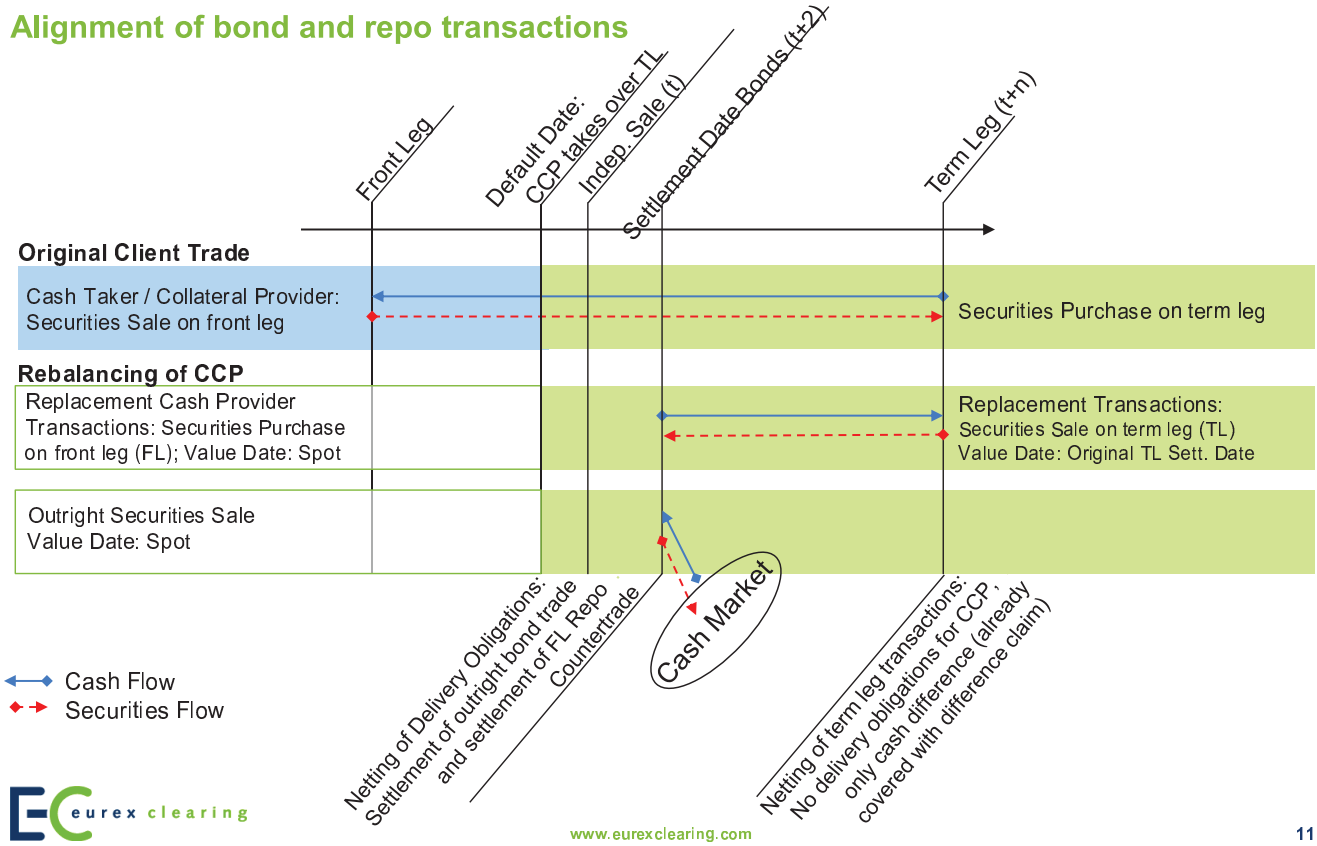

If a **cash provider defaults**, Eurex Clearing **acts as cash taker/ collateral provider in the frontleg** of the replacement repo (performing a 'repo'), **and buys the underlying bond** in the markets.

- At maturity of the term leg, the underlying bond and cash are exchanged via Eurex Clearing by the non-defaulted counterparty of the initial repo and the counterparty of the replacement repo.

* Please note that the order in which the two steps are executed may vary, depending on the repo type (cash provider versus cash taker) and depending on whether it is a special repo or a GC Pooling transaction.

# Example of liquidation concept: cash taker default

## Alignment of bond and repo transactions








# Independent sale as main component of default management process for bond liquidation group

## Non-defaulted clearing members act as buyers to the CCP in a crisis situation

- In the bond liquidation group, Eurex Clearing intends to sell all ISINs taken over from a defaulted Clearing Member via a so called independent sale.
- An independent sale means that **Eurex Clearing contacts potential counterparties** to sell the respective ISINs (via Bloomberg).
- Participation in an **independent sale is voluntary**.
  - Clearing members indicate towards Eurex Clearing via a Bond Trading Sheet for which bonds they would like to be contacted or have cash bond trading capabilities, whereby the execution would be via Bloomberg ALLQ.
  - Members can provide bids for any bond and any amount they are capable to trade during the liquidation period.
- An independent sale can be either public (Eurex Clearing contacts multiple potential counterparties) or private (Eurex Clearing contacts one counterparty), and either on a single ISIN level or for a bundle of ISINs.
- **An independent sale is successful if the prices provided by participating clearing members** result in losses which **do not exceed the collateral** provided by the defaulted clearing member.
  - Eurex Clearing will not use default fund contributions of non-defaulted clearing members, unless all respective clearing members have had the opportunity to provide a price for the ISIN(s) in an auction.

# Strong independent sale process

## Expectation to liquidate the majority of ISINs via voluntary participation

**ISINs sold independently via Bloomberg, by either**

1. **'Public' trade to small group of counterparties**
   Framework:
   a) A single ISIN would typically not be broken up into different tickets
   b) Trading request via Bloomberg to typically 3-5 participants (typically the less liquid ISIN, the fewer participants),
   c) The best bid wins
   d) Bids are covered by the collateral provided by the defaulted clearing member

2. **'Private' trade with single counterparty**
   'Special ISINs' are being identified (e.g. large ISINs, critical issuers), which should not be included in 'public' trades but rather sold via a 'private' trade.
   Framework:
   a) A single ISIN would typically not be broken up into different tickets
   b) Bids are covered by the collateral provided by the defaulted clearing member

The trades shall be done **bilaterally against Eurex Clearing** as the counterpart.

Bonds will be sold either on an ISIN by ISIN basis or in bundles, if bonds in the auction portfolio reflect (partially) hedged positions (long and short bond positions) or are hedged with futures.





# Handling of remaining bonds: auction process

## General framework: multi unit auction for remaining ISINs

An auction process is conducted, as a matter of last resort, **only if selected ISINs / bundles which were not successfully liquidated via independent sale within the available margin**.

**The following steps are initiated to prepare and perform a bond auction:**

1. Definition of bond clusters
2. Determination of involved clearing members in bond clusters
3. Calculation of the CM share per bond cluster
4. Determination of bidding amount and provision of bids
5. Determination of winning bids
6. Potential default fund juniorisation or penalties

# Eurex Clearing conducts auctions with mandatory participation by clearing members active in the respective bond clusters

## Multi unit auction for remaining ISINs for long bond positions

**Auction Format**

- Eurex Clearing sub-divides cleared bonds into dedicated clusters with similar bonds grouped by currency, region and issuer/bond type.
- Auction participation requirements are based on the respective clusters.
- One way, one off, sealed bid, multi unit pay-as-you-bid auction with respect to identical auction units per cluster.
- Best bids win the bid on amount of auction units at the provided bid price.

**Auction Participants**

- Mandatory participation for all clearing members
  - holding the necessary clearing license to acquire the portfolio,
  - have been active in the respective bond cluster during the last 3 months prior to default,
  - for GC Pooling collateral taker, have filled out the bond trading sheet and
  - have the necessary infrastructure in place to process the products.

The need to define bidding obligations only in proportion to a clearing member's risk exposure is a direct requirement of Article 37 (6) EMIR and serves to foster general market stability.

- Each auction participant is to bid at least for an individually defined minimum amount of auction units, depending on the initial margin of the auction participant relative to the overall initial margin in the bond cluster.
- The evaluation considers any activity across cash provider / bond purchaser and cash taker / bond seller.
- Clients can participate in auctions with permission of a clearing member.



Bond Risk Management September 2019

ICMA
International Capital Market Association

# Speaker Biography

| | |
|---|---|
| **Name:** | **Benjamin te Kaat** |
| **Job title:** | **Director, Head of Sales DACH** |
| **Company:** | **BNY Mellon Markets** |

Ben is a Director & Head of Sales for BNY Mellon Markets in the DACH region, based in Frankfurt. Ben joined BNY Mellon in March 2018. He started his career in 2000 as a securities lending trader at Morgan Stanley and moved more into a sales-trading role over the years covering Equity Finance products. Ben moved on to DekaBank in 2011 trading Delta One Derivatives for financing purposes. After leaving DekaBank in 2014, Ben was Head of Delta One and Financing Sales at Bank of America Merrill Lynch in Frankfurt, covering northern European clients.

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# Triparty Repo

September 2019

BNY MELLON

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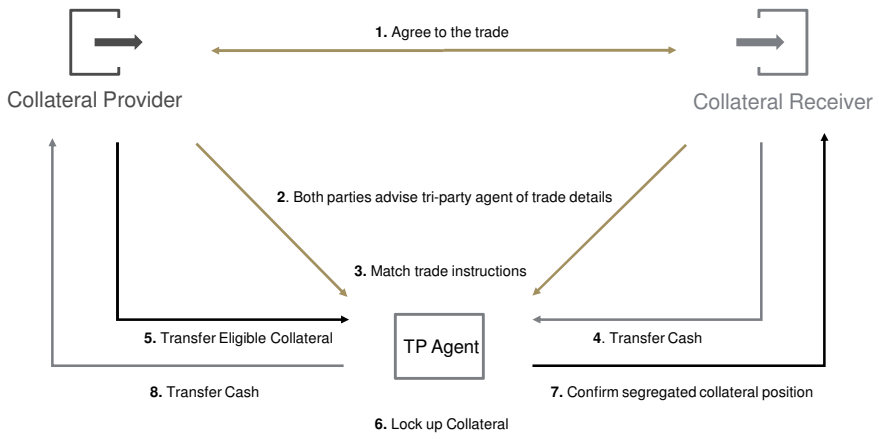
## Collateral Solutions

### Triparty Transaction Flow – Repo



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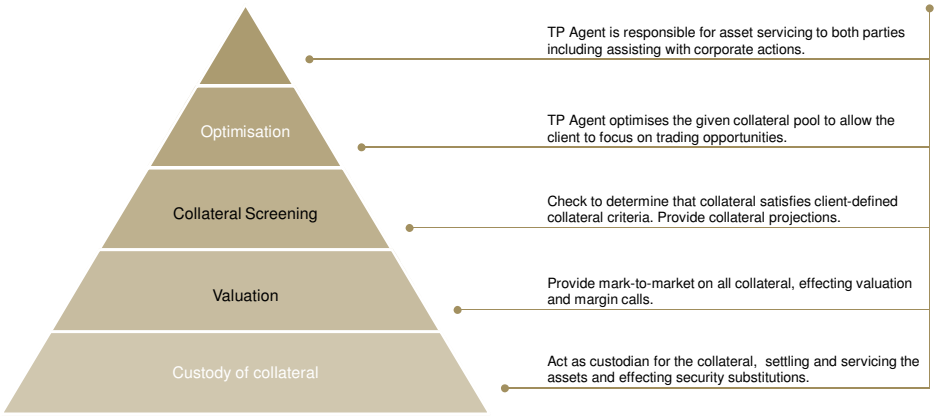
## Collateral Solutions



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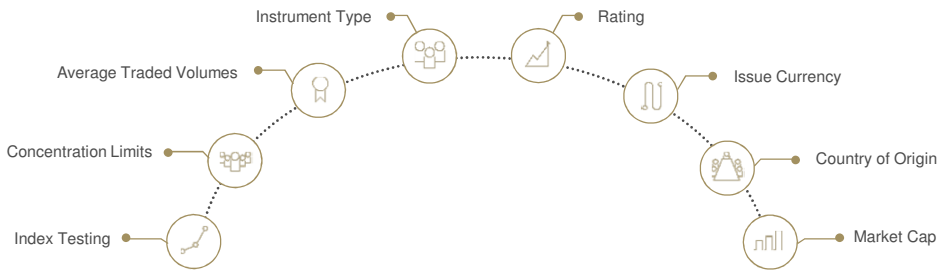
## Collateral Solutions

### Benefits

- Central collateral manager - settlement efficient
- Advanced collateral selection
- Provision of full collateral reporting

- Reduces settlement and income risk
- Employ experienced collateral manager






4

# Collateral Solutions

## Controlling Dividend Risk

TP Agent is responsible for asset servicing to both parties including assisting with corporate actions.

TP Agent substitutes or filters collateral so that income paying securities will reside in the collateral provider's account over record date unless separately agreed.

TP Agent allocates collateral based upon criteria mutually agreed between the collateral provider and collateral receiver.




5

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ICMA

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# Who uses tri-party repo and why? A non-bank user's view

***slides to be circulated post event**

ICMA Professional Repo Market & Collateral Management Course
Frankfurt 11-12 September 2019

# Basel capital & liquidity calculations for repo

**Richard Comotto**
ICMA Centre
University of Reading
United Kingdom

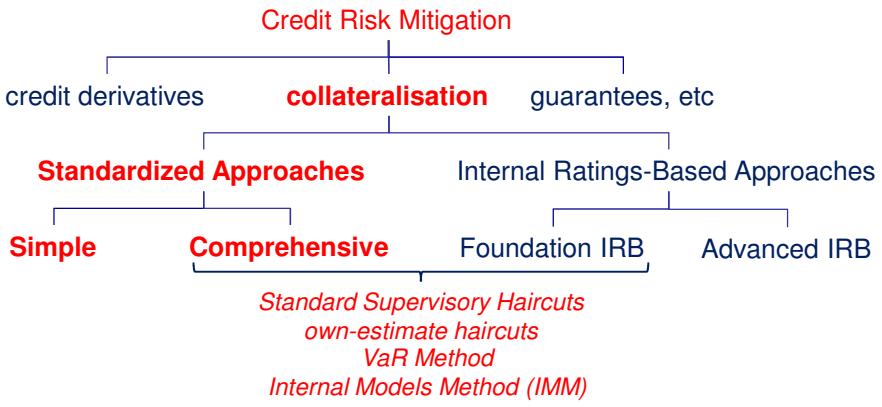



# Basel capital & liquidity calculations for repo

## topics

- Risk-Weighted Assets (RWA)
- Leverage Ratio
- Liquidity Coverage Ratio (LCR)
- Net Stable Funding Ratio (NSFR)

# RWA




3

3

# RWA

**credit risk mitigation for capital relief is dependent on:**

- only eligible financial collateral
- policies to control, monitor & report collateral risks, collateral concentration risk, collateral re-use risk & surrender of rights on collateral
- close monitoring of fails
- monitoring of settlement exposure
- no material wrong-way risk
- adequate resources for margining as evidenced by timeliness & accuracy of margin calls out & responses to margin calls in
- legal certainty --- well-founded legal documentation, assured legal right to liquidate collateral promptly
- clear & robust procedures for timely liquidation
- segregation of collateral from custodian's assets

4

4

# RWA

## Simple Standardized Approach:

- risk weight of collateral substituted for risk weight of counterparty for collateralized exposure
- eligible financial collateral as defined by regulator
- 20% floor to risk weight on certain repos of 0% risk-weighted bond
- 10% floor on certain repos of 0% risk-weighted bond
- 0% floor on certain single-currency repos of 0% risk-weighted bond by Core Market Participants (collateral is cash on deposit or collateral is other asset discounted by 20%)

5

5

# RWA

## Comprehensive Standardized Approach

capital charge for counterparty credit risk
= Risk-Weighted Asset (RWA) x capital ratio

Counterparty Risk Weight x exposure ≥ *8%*

- *probability of default*
- *given by regulators, typically based on external credit ratings (eg AA bank = 20%)*

volatility-adjusted exposure – volatility-adjusted collateral

cash – Standard Supervisory Haircut
*SSH given by regulators (eg cash = 0% haircut)*

additional haircuts for FX

collateral – Standard Supervisory Haircut
*SSH given by regulators (eg 10-year AA sovereign bond = 2.828% for 5-day liquidation period)*

6

6

# RWA

## Comprehensive Standardized Approach

- compare treatment of repo with unsecured loan
  - **repo**
    - 1W repo with AA-rated bank (CRW = 20%)
    - 100 of cash against 100 of AA-rated 10-year sovereign collateral (Standard Supervisory Haircut = 2.828%)
    - capital charge =
      - capital ratio * RWA
      - capital ratio * CRW * exposure
      - capital ratio * CRW * [cash - (collateral * (1 - H))]
      - 8% * 20% * [100 - (100 * (1 - 0.02828))] = **0.045248**

        collateral = 97.172

        exposure = 2.828
  - **unsecured loan**
    - loan of 100 to AA-rated bank (CRW = 20%)
    - capital charge =
      - 8% * 20% * 100 = **1.60**

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# RWA

## Comprehensive Standardized Approach:

- eligible financial collateral as defined by regulator (same as Simple Approach plus equities not in a main index & mutual funds holding such equities)
- holding period depends on type of transaction & frequency of mark-to-market & variation margining
  - repo-style transaction subject to daily MTM & VM = 5-day holding period
  - secured lending subject to daily MTM but no VM = 20-day holding period
- netting allowed under master netting agreements
- banks can be allowed to use their own estimates of uncorrelated volatilities instead of Standard Supervisory Hair subject to quantitative & qualitative criteria
- banks can be allowed to use their own VaR models or internal models to calculate correlated volatilities instead of Standard Supervisory Haircuts for repo-style transactions
- zero haircuts may be allowed on certain repos of 0% risk-weighted bond by Core Market Participants
- can be used for repo-style transactions in Trading Book

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# RWA

**additional capital charges on:**

- non-DvP settlement
- maturity mismatches between collateral & exposure --- if collateral less than a year, it is not recognized
- lack of robust procedures & processes to control “residual risks” = legal, operational, liquidity & market risks





# Leverage Ratio

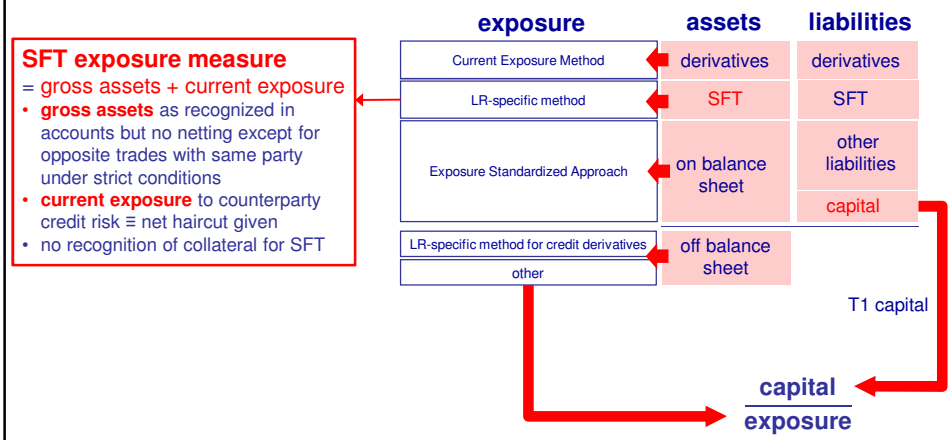
- **aim**
  - prevent excessive build-up of leverage by placing a floor under RWA capital (which may be inadequate because of poor models or data, or regulatory arbitrage)
- **calculation**

$$\text{Leverage Ratio} = \frac{\text{capital}}{\text{exposure}} \leq 3\%$$

  - Tier 1 capital
  - exposure measured using different methods for different classes of asset with limited netting (except across a CCP) & no account taken of collateralization

# Leverage Ratio

**SFT exposure measure**
= gross assets + current exposure
- **gross assets** as recognized in accounts but no netting except for opposite trades with same party under strict conditions
- **current exposure** to counterparty credit risk ≡ net haircut given
- no recognition of collateral for SFT






# Leverage Ratio

## Exposure Measure

outright purchase of 10 assets with 9 debt & 1 equity --- before any repos

| assets | | liabilities | |
|---|---|---|---|
| assets | 10 | equity (Tier 1) | 1 |
| | | payables | 9 |
| *LR exposure* | *10* | | |

LR = 1/10 = 10%

# Leverage Ratio

## Exposure Measure

repo of 10 assets for 10 cash

| assets | | liabilities | |
|---|---|---|---|
| SFT asset = collateral | 10 | equity (Tier 1) | 1 |
| SFT asset = cash | 10 | payables | 19 |
| *LR exposure (gross SFT assets)* | *20* | | |

LR = 1/20 = 5% (repo has halved LR)

13

# Leverage Ratio

## Exposure Measure

reverse repo of 10 assets for 10 cash

| assets | | liabilities | |
|---|---|---|---|
| SFT asset = receivable | 10 | equity (Tier 1) | 1 |
| | | payables | 9 |
| *LR exposure* | *10* | | |

LR = 1/10 = 10% (LR unchanged by reverse repo)

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# Leverage Ratio

## Exposure Measure

repo of 10 assets for 9 cash (haircut = 10%)

| assets | | liabilities | |
|---|---|---|---|
| SFT asset = collateral | 10 | equity (Tier 1) | 1 |
| SFT asset = cash | 9 | payables | 18 |
| current exposure | 1 | | |
| *LR exposure (gross SFT assets)* | *20* | | |

LR = 1/20 = 5%

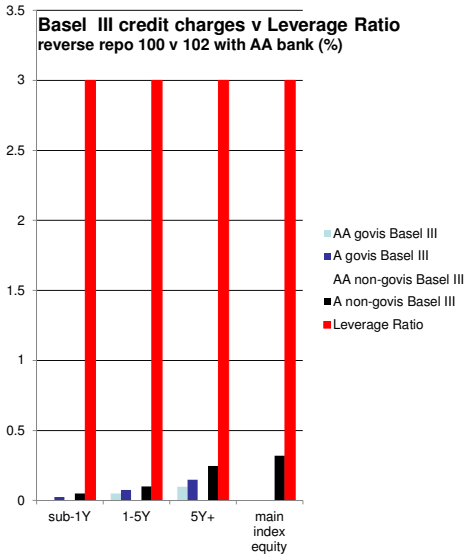
reverse repo of 10 assets for 9 cash

| assets | | liabilities | |
|---|---|---|---|
| assets | 1 | equity (Tier 1) | 1 |
| asset = receivable | 9 | payables | 9 |
| *LR exposure* | *9* | | |

LR = 1/10 = 10%

15

# Leverage Ratio

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# Liquidity Coverage Ratio

- **aim**
  - ensure short-term resilience in response to market illiquidity crisis
  - firms to have enough unencumbered high-quality liquid assets (HQLA) to sell or repo out, with little or no loss, to fund projected net cash outflow over a simulated 30-day liquidity crisis
- **calculation**

$$\text{LCR} = \frac{\text{stock of HQLA}}{\text{projected net cash outflow over 30–day crisis}} \geq 100\%$$

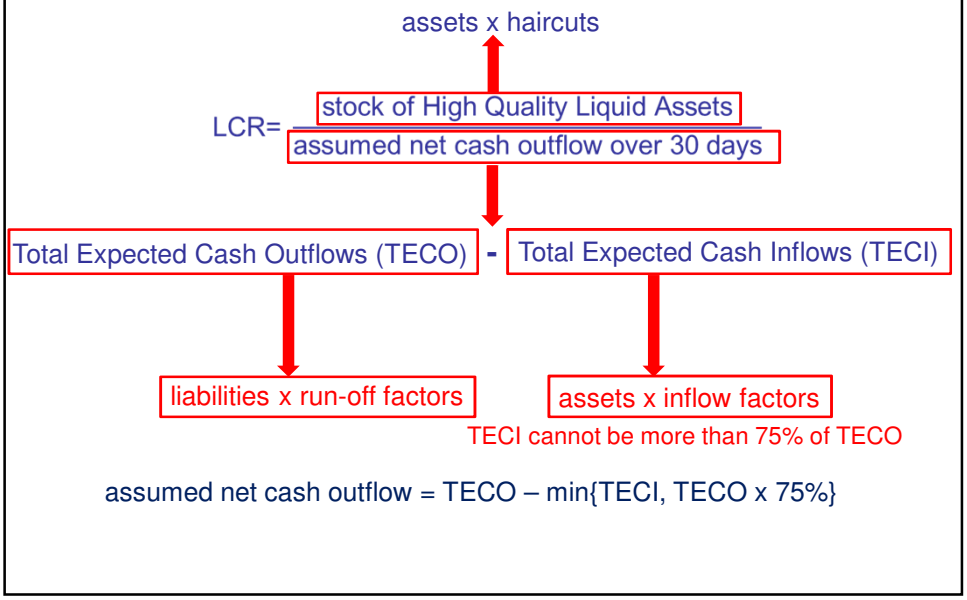
  - crisis scenario invented by regulators & expressed in terms of:
    - projected cash inflow = asset value x inflow factor
    - projected cash outflow = liability value x run-off factor



# Liquidity Coverage Ratio

$$\text{LCR} = \frac{\text{stock of High Quality Liquid Assets}}{\text{assumed net cash outflow over 30 days}}$$

# Liquidity Coverage Ratio




assumed net cash outflow = TECO – min{TECI, TECO x 75%}

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# Liquidity Coverage Ratio

reference


| HQLA | minimum haircut | limit |
|---|---|---|
| **Level 1** | | |
| coins & notes, drawable **central bank reserves** | 0% | 100% |
| Qualifying Market Securities from **0%-weighted sovereigns**, central banks, PSE, MDB | | |
| domestic debt of **non-0%-weighted sovereigns**, central banks in risk currency or home currency | | |
| **Level 2A** | | |
| Qualifying Market Securities from **20%-weighted sovereigns**, central banks, PSE, MDB | 15% | 40% |
| qualifying **corporate bonds** or **covered bonds** of AAA or AA | | |
| **Level 2B** | | |
| qualifying **RMBS** | 25% | 15% |
| qualifying **corporate bonds** of A or lower | 50% | |
| qualifying **common equity** | | |

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# Liquidity Coverage Ratio

reference

| key liability run-off factor --- how much funding you will lose | |
|---|---|
| SFT against **Level 1 HQLA** | 0% |
| SFT with central bank | |
| SFT against **Level 2A HQLA** | 15% |
| SFT against **Level 2B RMBS** | 25% |
| SFT with domestic sovereign not against Level 1/2A HQLA | |
| SFT with domestic PSE ≤ 20% RW not against Level 1/2A HQLA | |
| SFT with MBD not against Level 1/2A HQLA | |
| uninsured wholesale deposits from non-financials & public sector | 40% |
| SFT against **other Level 2B HQLA** | 50% |
| SFT against **non-HQLA** | 100% |
| unsecured wholesale funding from financials & other funding | |

*financial includes central bank*

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# Liquidity Coverage Ratio

reference

| key asset inflow factor --- how much lending you will stop | |
|---|---|
| SFT against **Level 1 HQLA** | 0% |
| short positions extendible >30 days covered by SFT | |
| SFT against **Level 2A HQLA** | 15% |
| SFT against **Level 2B RMBS** | 25% |
| wholesale loans to non-financials & public sector | 50% |
| SFT against **other Level 2B HQLA** | |
| SFT against **non-HQLA** | 100% |
| wholesale loans to financials | |

*financial includes central bank*

22

# Liquidity Coverage Ratio

$$LCR = \frac{\text{HQLA x haircut}}{\text{(liabilities x run-off factor) - MIN\{assets x inflow factor, 75\% x outflows\}}}$$

Repo of 100 cash v 100 Level 1 HLQA for less than 30 days

- asset repoed out is not part of HQLA stock as it is encumbered & cannot be used again
- cash received in repo is not part of HQLA stock as it is paid out to fund the purchase of the asset

$$LCR = \frac{0}{(100 \times 0\%) - 0} = \frac{0}{0} = 0 \text{ [no need for HQLA]}$$

TECO --- it is assumed you would be able to roll-over 100% of repos of Level 1 collateral during a crisis, which means 0% run-off of liabilities when these repos mature

TECI --- as repo is borrowing, there will be no inflow of cash when they mature

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# Liquidity Coverage Ratio

$$LCR = \frac{\text{HQLA x haircut}}{\text{(liabilities x run-off factor) - MIN\{assets x inflow factor, 75\% x outflows\}}}$$

Repo of 100 cash v 100 non-HQLA for less than 30 days

- asset repoed out is not part of HQLA stock as it is encumbered & cannot be used again
- cash received is not part of HQLA stock as it is paid out to fund the purchase of the asset

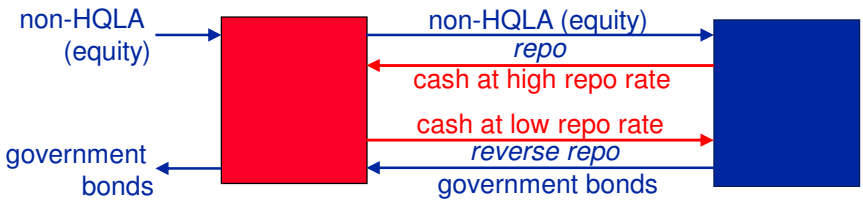
$$LCR = \frac{0}{(100 \times 100\%) - 0} = \frac{0}{100} = 0 \text{ [need 100 for HQLA]}$$

TECO --- it is assumed you would be able to roll-over 0% of repos of non-HQLA collateral during a crisis, which means 100% run-off of liabilities when these repos mature

TECI --- as repo is borrowing, there will be no inflow of cash when they mature

24

# Liquidity Coverage Ratio

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# Liquidity Coverage Ratio

$$LCR = \frac{\text{HQLA x haircut}}{\text{(liabilities x run-off factor) - MIN\{assets x inflow factor, 75\% x outflows\}}}$$

Collateral swap = repo 100 equity & reverse 100 govis for same cash for under 30 days

- equities repoed out are not part of HQLA stock as they are encumbered & cannot be used again
- government bonds reversed in can be sold/repoed, so are part of stock of HQLA & have a 0% haircut as they are Level 1 HQLA.

$$LCR = \frac{100 \times (1 - 0\%)}{(100 \times 50\%) - MIN\{100 \times 0\%, 75\% \times 50\}} = \frac{100}{50} = 200\%$$

TECO --- it is assumed you would be able to roll-over 50% of repos of Level 2B equity during a crisis, which means 50% run-off of liabilities when these repos mature.

TECI --- it is assumed you would be able to roll-over 100% of reverse repos against Level 1 during a crisis, which means 0% inflow when these repos mature, which is smaller than 75% of TECO, so TECI = 0%.

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ICMA Professional Repo Market & Collateral Management Course
Frankfurt 11-12 September 2019

# Net Stable Funding Ratio (NSFR)

**Richard Comotto**
ICMA Centre
University of Reading
United Kingdom




# Net Stable Funding Ratio

- **aim**
  - ensure enough stable funding to cover outflows over 1 year of extreme stress
  - secondary aims are to reduce:
    - reliance on short-term wholesale funding
    - maturity transformation in bank lending to hedge funds
- **calculation**

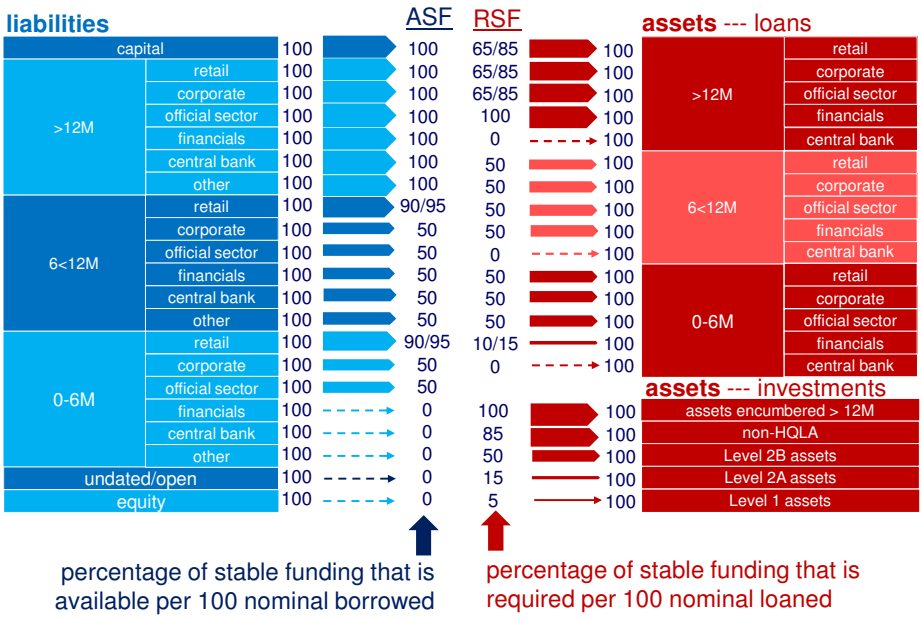
$$\text{NSFR} = \frac{\text{available stable funding}}{\text{required stable funding}} \geq 100\%$$

# Net Stable Funding Ratio

- **available stable funding**
  - balance sheet value of liability x ASF factor
  - ASF factor measures share of a liability which it is assumed could be rolled over in a crisis
  - general assumption is that funding is more stable if it is longer-term or from non-financial or retail sources
- **required stable funding**
  - balance sheet value of asset x RSF factor
  - RSF factors are different for investments & loans
  - RSF factor measures share of an asset that cannot easily be sold/repoed in a crisis & therefore needs stable funding
  - general assumption is that more stable funding is required for lending or investments that are longer-term or to non-financial or retail borrowers
  - some RSF factors also reflect regulator's wish for banks to maintain credit to the real economy in a crisis & the likelihood of banks rolling over loans to some customers to preserve relationships



# Net Stable Funding Ratio



ICMA
International Capital Market Association

# Speaker Biography

| | |
|---|---|
| **Name:** | **Pascal Nicoloso** |
| **Job title:** | **Principal Market Operations Expert** |
| **Company:** | **European Central Bank** |

Current: Pascal Nicoloso has been working at the ECB since 2001, and in the Money Market and Liquidity division in DG Markets since 2013. He is currently in charge of the Money Market Structure and Data analysis group and business project manager for €STR in DG Markets. His group also acts as the Secretariat of the Working Group on Risk-Free Rates.

Past experience: Pascal Nicoloso was portfolio manager in the Banque de France and in the ECB for most of his career, and was closely involved in the design and execution of the first purchase programmes that the Eurosystem has put in place in the years 2009-2013 (Covered Bonds Purchase Programme, Securities Market Programme).

Since then he has been involved in money markets and monetary policy implementation where he could take part to the setup of TLTROs 1 and 2. Since 2016 Pascal Nicoloso has been also involved in the design and implementation of the Money Market Statistical Regulation, which is now used as the basis for the upcoming production of the euro short-term rate.

Background: graduated from Institut d' Etudes Politiques de Paris in 1991, with a major in public law and administration, and from the CERAM in Nice in 1997 where he got a Masters in financial markets.

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EUROPEAN CENTRAL BANK
EUROSYSTEM

**Pascal Nicoloso**
European Central Bank
DG Market Operations
Money Market and Liquidity Division

# The transition to €STR: the time is now!

ICMA repo and collateral course
Frankfurt, 12 September 2019

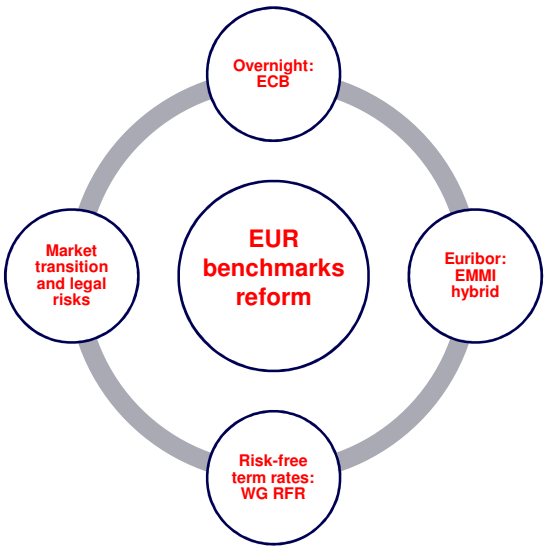
Disclaimer: personal views expressed in this presentation may not reflect the views of the ECB.

1



## Foreword

Benchmark reform: multiple dimensions and actors





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## Main points

**The new overnight reference rate, €STR**

- Principles, rate behaviour

**What will change and when**

- The transition starts soon!

**Summary of global reform**

- Various approaches





## Overview

## Main features of the rate

Scope: unsecured overnight deposits to measure borrowing costs

Calculation: weighted average, trimming 25%

Data sufficiency policy: contingency triggers (20 banks, 75% top 5 banks' concentration ratio)

Governance and processes: €STR published at 08:00 am Frankfurt time

Publication policy and transparency on errors

Rate published daily from 2 October 2019

Pre-€STR publications since 28 June

Do you want to know more?

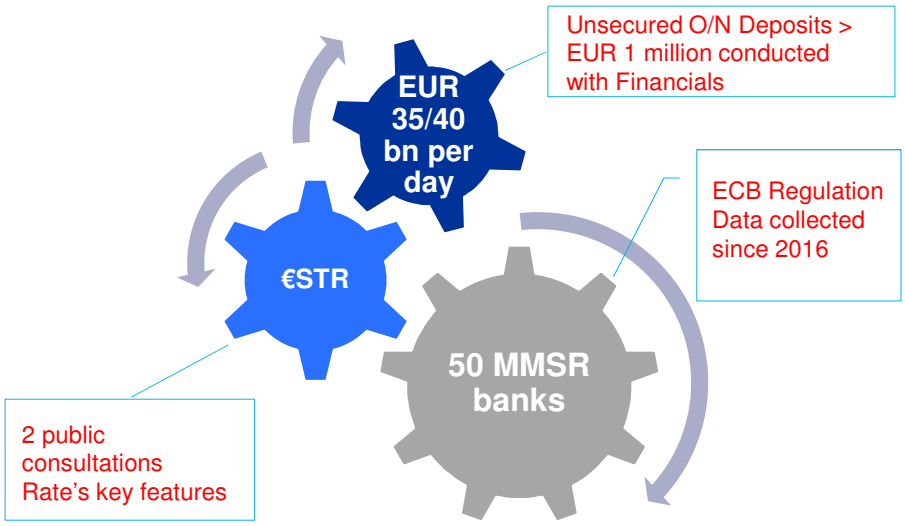
**Parameters more detailed in the statement of methodology**
**https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/shared/pdf/ecb.ESTER_methodology_and_policies.en.pdf**



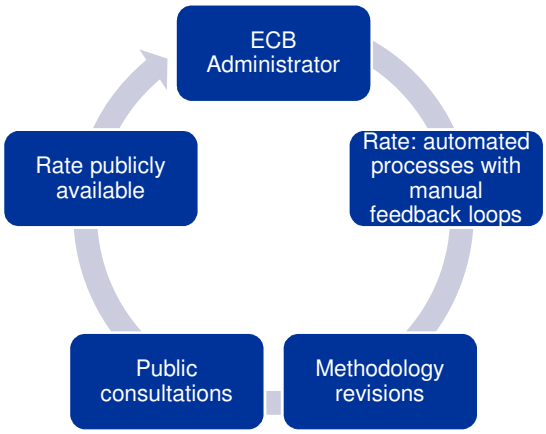




## €STR is fully transactions-based: how does it measure the underlying interest?



## Governance




**€STR methodology will be re-assessed annually and**

- **Adapted with market changes,**
- **Or re-confirmed**







## Publication policy

| Rate determination | Additional information |
|---|---|
| 1) Rate, 3 decimals<br>2) Total volume<br>3) Number of transactions<br>4) Mode: normal, contingency | 1) Number of banks<br>2) Share volume by largest 5 reporting banks<br>3) Rates at 25th and 75th percentiles |

**Rate is well explained to the markets and the public**

## EONIA vs. ECB Euro Short term Rate (€STR)

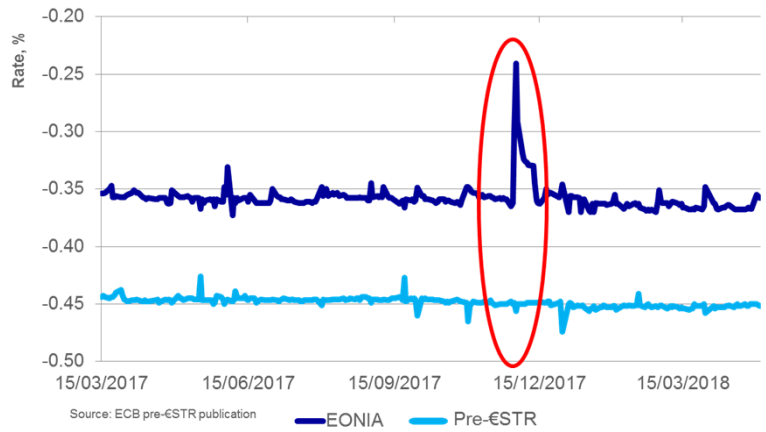
| EONIA | Euro short-term rate |
|---|---|
| EUR | EUR |
| Overnight | Overnight |
| Unsecured | Unsecured |
| Transaction Based | Transaction Based |
| Unstable Panel | Stable reporting sample |
| Interbank | Wholesale |
| Bank Lending | Bank Borrowing |
| Published on T | Published on T+1 |





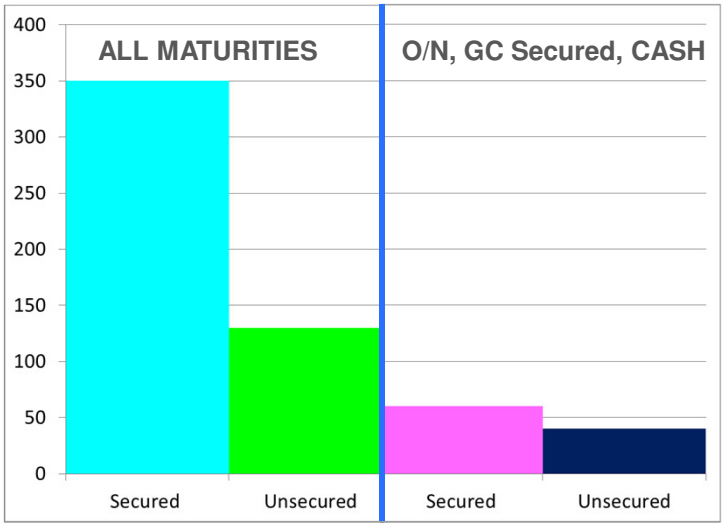


## Trimming: outliers filtered out




- Rate reacts to market factors (Excess Liquidity, rate falls at quarter-ends)
- While being less vulnerable to outliers
- Pre-€STR (post corrections) very similar to €STR (based on 7:00 data)

## Unsecured or secured?



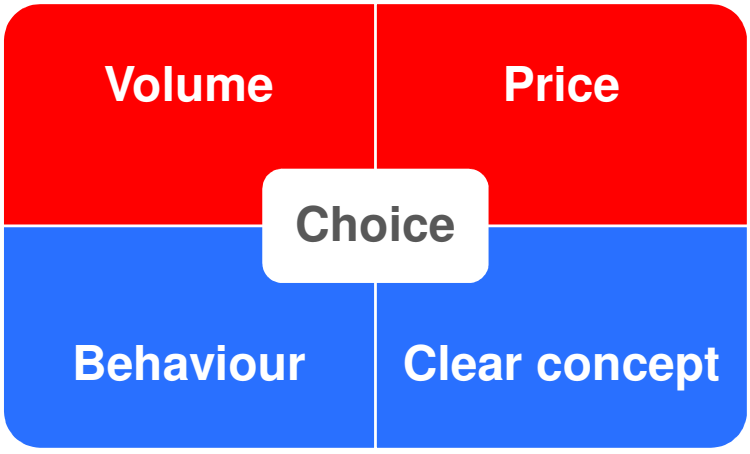

The information quantity trade-off: compare what is comparable!







## Does only size matter? No!




Larger volatility of secured over year-end due to fluctuating underlying: cash or bonds?
Unsecured clearer and more stable as the only variable is cash

## Overview

1 The new rate

**2 The transition**

3 Broad summary of the ongoing benchmark reform

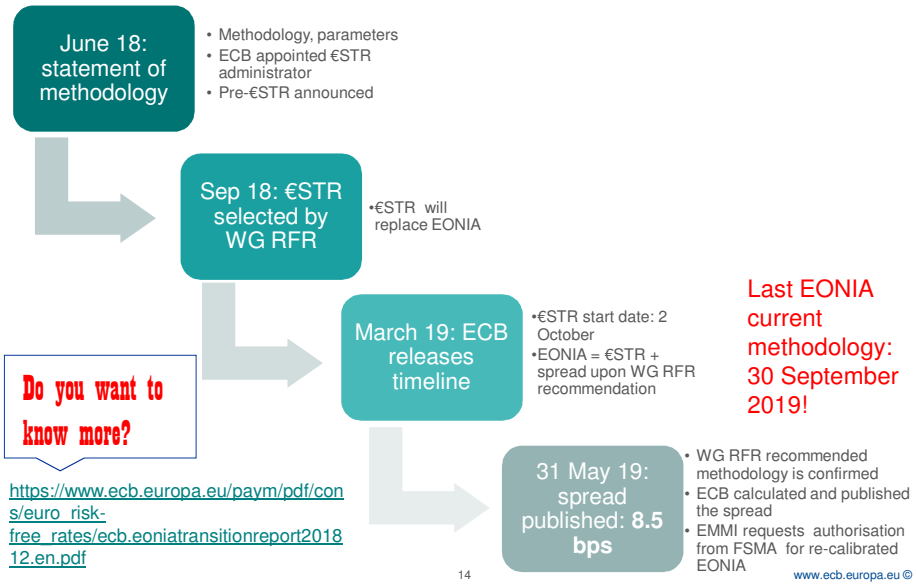








## Timeline



## 2 October 2019: €STR and EONIA reformed first publication date

- WG recommendations on the transition path from EONIA to €STR published 14 March 2019
  - EONIA methodology to become the €STR + fixed spread until the end 2021
- 31 May 2019:
  - EMMI published results from their consultation on the change of EONIA's methodology, confirming WG recommendations
  - ECB published a press release announcing the fixed spread (calculation based on WG recommendation) of 8.5 bps using recommended WG RFR methodology
  - ECB updated €STR webpage and €STR Q&A

### Next steps

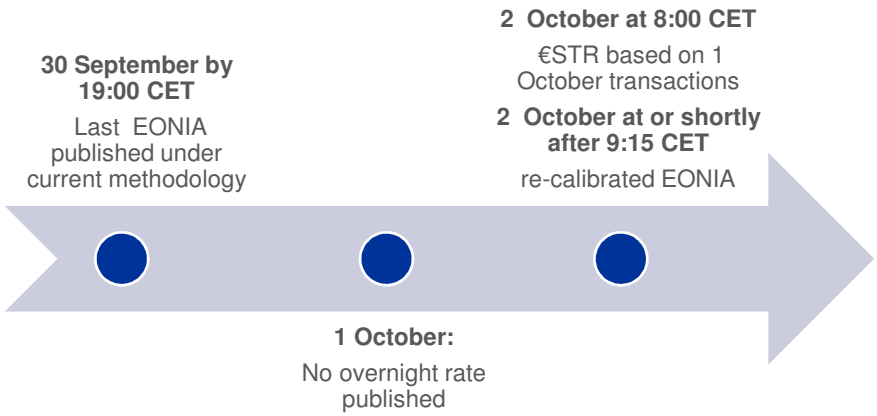
- 2 October 2019:
  - Start of €STR publication and change in EONIA methodology
  - EONIA publication to move from T to T+1







## The move from EONIA in T to €STR in T+1



## Internal preparations are necessary

| Processes | Documentation |
|---|---|
| √ Use the new rate | √ Procedures |
| √ Systems: new timing | √ Contracts, fall backs |
| √ Dealing, hedging | √ New products |

**IT setup for €STR:**
**ISIN: EU000A2X2A25**
**German WKN: A2X2A2**
**FISN: ECB/EUR EURO SHORT-TERM RATE IR**



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**WG RECOMMENDATIONS**

- Use €STR in new contracts and products as soon as possible
- EONIA fallback rate → €STR + Spread

**LEGAL ACTION PLAN**

**NEW EONIA CONTRACTS**

- Robust fallback → €STR + Spread
- AND
- Acknowledgment → (before Oct'19) EONIA before 2 Oct'19 = EONIA after 2 Oct'19

**LEGACY EONIA CONTRACTS**

- Replacement → €STR + Spread or €STR (*)
- OR
- Embed robust fallback → €STR + Spread or €STR (*)
- AND
- Acknowledgment → (before Oct'19) EONIA before 2 Oct'19 = EONIA after 2 Oct'19



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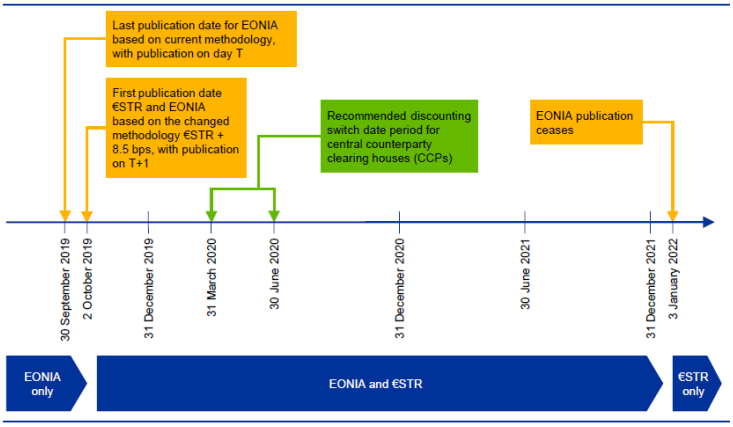
## Impact on cash and derivatives (1) timeline

Timeline for the transition from EONIA to the €STR




WG recommendations in report published in August 2019:
https://www.ecb.europa.eu/pub/pdf/other/ecb.wgeurorfr_impacttransitioneoniaeurostrcashderivativesproducts~d917dffb84.en.pdf







## Impact on cash and derivatives (2) T to T+1

| Product | Current | Recommended | Comments |
|---|---|---|---|
| **Risk and finance** | Change IT systems to apply the new rate availability schedule | | |
| **Settlement/collateral** | Overnight batches | Reschedule IT systems to next day | Limit operational risk |
| **EONIA-related derivatives/money market** | T+1 | T+2 | There can be a one-day difference between nominal and interest payment |
| **Cleared derivatives (VM remuneration)** | T+1 | T+1 | Use last available rate |
| **Securities (coupons)** | T+1 | T+1 | Valuation/accounting procedures timing to change |
| **Secured market** | Aligned with ERCC recommendations | | |
| **Current accounts, facilities and overdraft facilities** | T+1 | T+1 or T+2 | Use last available rate + adjustment if T+1 maintained |
| **Swingline facilities** | Aligned with LMA recommendations. No changes expected | | |
| **Investment funds** | T+1 | T+1 | NAV-related processes cannot be changed so use of the last available rate + adjustment |
| **FTP models** | | | Move to new rate publication schedule or last available rate + adjustment |
| **Client communication** | Communicate the transition process both in a transparent way and as far in advance as possible. | | |

## Overview

1 The new rate

2 The transition

**3 Broad summary of the ongoing benchmark reform**







- **Working Group on Risk Free Rates created in 2018**
  - Objective: to identify and recommend risk-free rates that could serve as a basis for an alternative to current benchmarks used in a variety of financial instruments and contracts in the euro
- **Membership**
  - 21 EU banks (chair: ING)
  - 7 non-voting members (associations, benchmark providers, buy-side)
  - 4 observers (public institutions, of which ECB provides secretariat)
  - Membership in sub-groups is broader
- **Work streams**
  - **Identify risk-free rate (RFR); recommend EONIA transition path**
  - **Term rates as fall-back for Euribor**
  - **Contractual robustness (legacy contracts; legal issues)**

## The Euribor reform

- EMMI's EURIBOR reform under the hybrid methodology is still ongoing. Complete phased-in expected by the end of the year
- On 2 July, EMMI granted authorisation by FSMA
- The WG is working on identifying €STR-based fallbacks for EURIBOR:
  - Since 1 Jan 2018, supervised entities using benchmarks are required to fulfil Article 28(2) of the EU BMR
  - Possible methodologies:
    - Forward looking methodologies: including expectations.
    - Backward looking methodologies: based on calculations over realised rates.



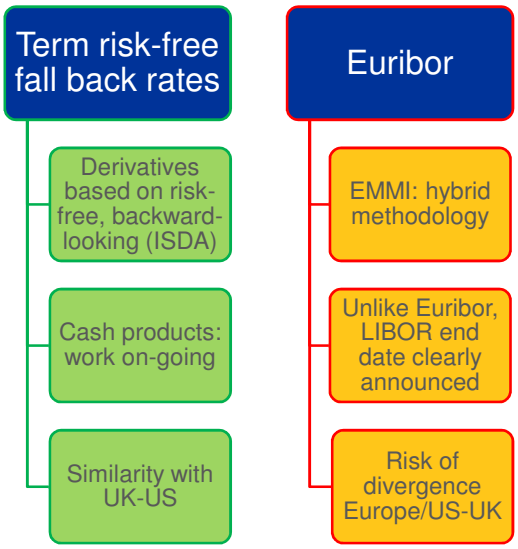




## Divergences and similarities (1): overnight

| | | | | |
|---|---|---|---|---|
| USD LIBOR | EURIBOR, EUR LIBOR, EONIA | GBP LIBOR | CHF LIBOR | JPY LIBOR |
| Alternative Reference Rates Committee | Working Group on Euro Risk-Free Rates | Working Group on Sterling Risk-Free Rates | National Working Group on Swiss franc Reference Rate | The Study Group on Risk-Free Reference Rates |
| Secured Overnight Finance Rate (SOFR)<br>Selected in June 2017 | Euro Short-Term Rate (€STR)<br>Selected in Sept 2018 | Reformed Sterling Overnight Index Average (SONIA)<br>Selected in Apr 2017 | Swiss Average Rate Overnight (SARON)<br>Selected in Oct 2017 | Tokyo Overnight Average Rate (TONAR)<br>Selected in Dec 2016 |
| Federal Reserve Bank of NY | European Central Bank | Bank of England | SIX exchange | Bank of Japan |
| Secured | Unsecured | Unsecured | Secured | Unsecured |
| Secured rate that covers multiple overnight repo market segments | Unsecured rate that captures overnight wholesale deposit transactions | Unsecured rate that covers overnight wholesale deposit transactions | Secured rate that reflects interest paid on interbank overnight repo | Unsecured rate that captures overnight call rate market |

# Divergences and similarities (2): term rates



ICMA
International Capital Market Association

# Speaker Biography

| | |
|---|---|
| **Name:** | **Andy Hill** |
| **Job title:** | **Senior Director, Market Practice and Regulatory Policy** |
| **Company:** | **International Capital Market Association (ICMA)** |

Andy Hill is a Senior Director in ICMA's Market Practice and Regulatory Policy group, where he oversees the association's work on corporate bond secondary markets. He is secretary to ICMA's Secondary Market Practices Committee and previously was a member of the European Commission's Expert Group on Corporate Bond Market Liquidity. Since 2019, Andy also oversees ICMA's work related to repo and collateral.

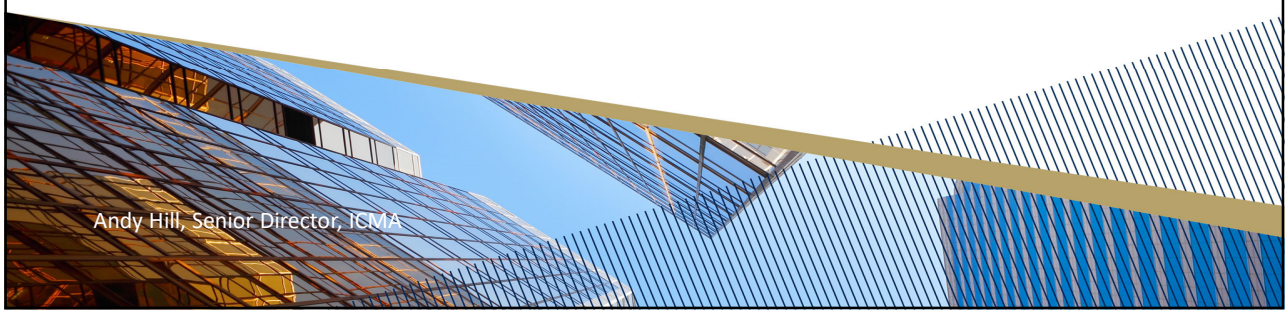
Prior to joining ICMA in 2014, Andy was a repo and money market trader for seventeen years, for ten years of which he was an Executive Director at Goldman Sachs.

He has also worked as a consultant in the Aid and Development sector, primarily based in Cambodia, and previously served on the Board of the Cambodian NGO Education Partnership in Phnom Penh while on a Goldman Sachs Public Service Fellowship.

Andy holds a BSc (Hons) in Business Studies from Cass Business School and an MSc in Poverty Reduction and Development Management from the University of Birmingham.

# CSDR Mandatory Buy-ins & SFTs

ICMA Professional Repo & Collateral Management Course
Frankfurt, September 12 2019



Andy Hill, Senior Director, ICMA

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## Agenda

1. What is a buy-in and how do they work?
2. What is a mini close-out and how do they work?
3. CSDR mandatory buy-ins
4. Considerations for in-scope SFTs
5. Considerations for out-of-scope SFTs
6. Conclusion

Annex I: Resources and useful links

Annex II: What is ICMA doing about CSDR-SD?

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## 1. What is a buy-in and how do they work?



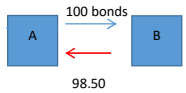


### What is a buy-in?

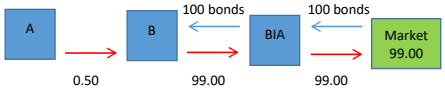
- Buy-ins generally apply to failing cash transactions and not to SFTs.
- In the event of a settlement fail, a buy-in mechanisms provide a buyer of securities the contractual right to source the securities elsewhere (usually for guaranteed delivery), cancel the original trade, and settle between the two original counterparties any differences arising from the net costs of the original transaction and the buy-in transaction.
- A key feature of conventional buy-ins (such as the ICMA Buy-in Rules, used in the cross-border non-cleared bond markets) is that the economics of the original transaction are preserved, and that neither party is inadvertently disadvantaged or advantaged as a result of the buy-in.
- Standard buy-ins are not a 'penalty mechanism', they are a contractual remedy to provide for physical settlement of a trade.
- They are also executed at the discretion of the failed-to (non-defaulting) entity, as a right and not an obligation.
- Traditionally the buy-in is executed by a buy-in agent: and independent 3rd party appointed by the non-defaulting party (although this requirement was recently removed from the ICMA Buy-in Rules).
- A 'pass-on' mechanism allows for a single buy-in to be passed along a chain of linked failing transactions.

## How do buy-ins work?

Original trade

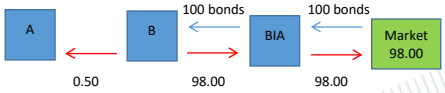



Buy-in at a higher price




| | A | B |
|---|---|---|
| P&L before buy-in | (0.50) | +0.50 |
| P&L after buy-in | (0.50) | +0.50 |
| P&L impact of buy-in | 0 | 0 |

Buy-in at a lower price



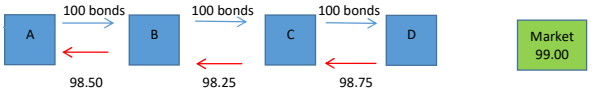

| | A | B |
|---|---|---|
| P&L before buy-in | +0.50 | (0.50) |
| P&L after buy-in | 0.50 | (0.50) |
| P&L impact of buy-in | 0 | 0 |

5



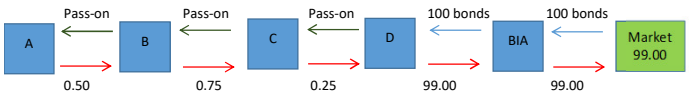
## How do 'pass-ons' work?

Original trade



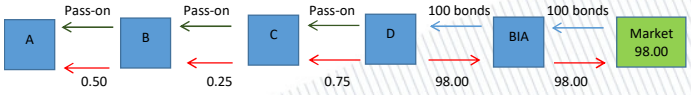

A 'pass-on' mechanism allows each party in the transaction chain to pass-on a buy-in notification to the party failing to them, until it reaches the original fail. A single buy-in is executed by the initiating party, and the cash differentials between each original transaction and the buy-in price is settled between each of the parties in the chain.

Buy-in with pass-on




| | A | B | C | D |
|---|---|---|---|---|
| P&L before buy-in | (0.50) | (0.25) | +0.50 | +0.25 |
| P&L after buy-in | (0.50) | (0.25) | +0.50 | +0.25 |
| P&L impact of buy-in | 0 | 0 | 0 | 0 |

Buy-in with pass-on (lower price)

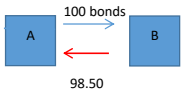



| | A | B | C | D |
|---|---|---|---|---|
| P&L before buy-in | 0 | (0.25) | +0.50 | (0.25) |
| P&L after buy-in | 0 | (0.25) | +0.50 | (0.25) |
| P&L impact of buy-in | 0 | 0 | 0 | 0 |

6

## Is there a cost to the party being bought-in?

Original trade

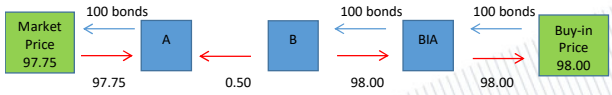



Generally the bought-in counterparty will incur a cost as a result of the buy-in. This is the result of the buy-in price being higher than the prevailing market price. The difference between the buy-in price and current market price is known as the 'buy-in premium').

Usually buy-in prices are higher than the prevailing market price due to a premium for 'guaranteed delivery'. But it can also be due to costs/spreads added by the buy-in agent, and also as a result of a market signaling mechanism with a 'stressed buyer' in the market.

Importantly, these costs have nothing to do with the original transaction price.

Post buy-in




| | A | B |
|---|---|---|
| P&L before buy-in | +0.75 | (0.75) |
| P&L after buy-in | +0.50 | (0.75) |
| P&L impact of buy-in | (0.25) | 0 |





## 2. What is a mini close-out and how do they work?

## What happens if a party fails to deliver collateral on the start-leg of an SFT?

In the event of a failure by a seller to deliver collateral to the buyer at the start of a repo, if the parties have signed a GMRA,[1] one of the following will happen:

- If the parties have agreed, when they negotiated their agreement, to treat a failure to deliver collateral as an event of default, the buyer could place the seller in default. However, putting a counterparty into default is a very serious step. It is important to be sure that her failure to deliver reflects credit problems and not temporary operational problems, infrastructure frictions or market illiquidity, which are all beyond the seller's control.
- The contract remains in force but the buyer withholds cash from the seller. This option allows the seller to deliver the collateral at any time during the remaining life of the contract. Only if and when delivery eventually takes places will the buyer pay the seller. But whether or not the seller ever delivers the collateral, at the end of the repo, the seller will be obliged to pay to the buyer the repo interest for the full intended term of the transaction. This means that the seller is penalised for failing to deliver and the buyer is compensated.
- The buyer terminates the failed transaction (he can do this at any time). If she does, the seller will be obliged to pay whatever repo interest has accrued up to the date of termination.

[1] GMSLA provisions are broadly similar





## What happens if a party fails to deliver collateral on the end-leg of an SFT?

In the event of a failure by a seller to deliver collateral to the buyer at the start of a repo, if the parties have signed a GMRA,[1] one of the following will happen:

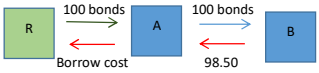
- If the parties have agreed, when they negotiated their agreement, to treat a failure to deliver collateral as an event of default, the seller could place the buyer in default.
- The seller could call a ***mini close-out***, which means he terminates the failed transaction (but no others), values the collateral in that transaction using the methodology set out in the GMRA for defaults, offsets this against the cash she owes the buyer and settles any difference. However, mini close-outs can prove to be very expensive for parties failing to deliver. In repo markets, such as those for government bonds, which trade at narrow spreads, it is felt that the threat of mini close-outs would drive many banks out of the market and fatally damage its liquidity, so mini close-outs are in practice restricted to fails in types of collateral such as corporate bonds. Note that the mini close-out mechanism works differently from the 'buy-in' procedure used in the cash market when the seller fails to deliver to the buyer in an outright transaction.
- The parties could negotiate a solution. Until then, the repo would continue, with the seller holding cash which will be interest-free after the repurchase date.

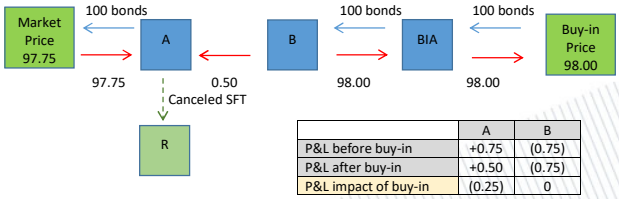
[1] GMSLA provisions are broadly similar

## The link between SFTs and cash trades: failing start-legs

Securities financing transactions (SFTs) are an integral component of liquidity provision in securities markets. As market-makers cannot realistically hold inventory in every security for which they make markets, in most instances they will need the ability to sell short in order to provide offers to clients. To do this, they will need to borrow the underlying security, which they do in the repo or securities lending markets.

If the SFT start-leg fails, the cash sale will fail, with the risk of a buy-in. The seller will not be able to pass any buy-in costs on to the failing repo counterparty.




| | A | B |
|---|---|---|
| P&L before buy-in | +0.75 | (0.75) |
| P&L after buy-in | +0.50 | (0.75) |
| P&L impact of buy-in | (0.25) | 0 |



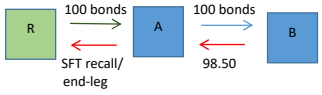


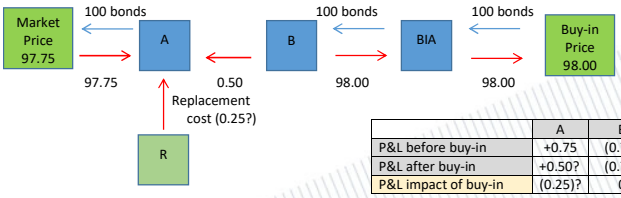
## The link between SFTs and cash trades: failing end-legs

Lenders of securities require the flexibility to recall the loan in the case of a sale. The risk is that the securities are not returned, which causes the onward sale to fail. This creates the risk of a buy-in.

While it is not possible to 'pass-on' a cash market buy-in under a GMRA,[1] it may be possible to pass-on any buy-in costs through the mini close-out mechanism, since it could be argued that the buy-in cost is effectively the cost of replacing the securities.

However, this could be challenged by the failing repo counterparty.




| | A | B |
|---|---|---|
| P&L before buy-in | +0.75 | (0.75) |
| P&L after buy-in | +0.50? | (0.75) |
| P&L impact of buy-in | (0.25)? | 0 |

[1] GMSLAs, however, do provide for buy-in costs to be passed-on through a mini close-out

## 3. CSDR mandatory buy-ins





### What is CSD Regulation & CSDR Settlement Discipline?

- CSD Regulation (CSDR) is an EU regulation which introduces measures for the authorization and regulation of EU central securities depositories (CSDs).
- While much of the regulation focuses on the prudential, organizational, and business standards of CSDs, some of its requirements directly affect trading level entities that settle trades on EU CSDs. This **includes measures to address settlement fails**.
- Chapter III of the Regulation deals with **Settlement Discipline**. Article 7 provides for measures to address settlement fails, which includes **cash penalties** for settlement fails and **mandatory buy-ins**.

## What is the scope of CSDR Settlement Discipline?

- Settlement Discipline will apply to all transactions intended to settle on an EU CSD[1] in transferable securities, money-market instruments, units in collective investment undertakings, and emissions allowances,[2] which are admitted to trading or traded on a trading venue or cleared by a CCP.[3]
- This will apply to all **trading level entities regardless of their domicile**, that enter into such transactions that settle on an EU CSD, whether directly as CSD members, or indirectly via a settlement or clearing agent (a "CSD participant").
- It is important to note that initiating the CSDR buy-in process is a **regulatory requirement** and not a right.
- Securities financing transactions (SFTs) are in scope of settlement discipline. [4]
- SFTs with terms ≥ 30 business days are in scope of mandatory buy-ins. [5]

[1] Articles 1(1) and 1(2)
[2] Article 5(1)
[3] Article 7(10)
[4] Article 7(4)(b)
[5] RTS: Article 22(2)





## When does CSDR Settlement Discipline come into force?

- CSDR was passed into law in August 2014.
- The draft RTS for mandatory buy-ins were submitted by ESMA in February 2016 and adopted by the European Commission in May 2018.
- Following a three-month period for scrutiny by the European Parliament and EU Council, the RTS was published in the EU Official Journal in September 2018.
- The provisions for settlement discipline will then be applied after 24 months (so September 2020).
- However, due to a technicality, relating to the roll-out of a SWIFT messaging update required to support the implementation of cash penalties, the SD package (including mandatory buy-ins), will likely come into force in **November 2020**.

## What is a CSDR mandatory buy-in?

- Executed at trading level (similar to conventional buy-in mechanisms).
- For non-centrally cleared trades, requires the appointment of a buy-in agent.
- Buy-in process is automatically triggered 4 business days after intended settlement date (ISD) for liquid[1] equities, and 7 business days after ISD for all other instruments, including bonds (called the "extension period").
- Buy-in must be completed (settled) within 4 business days[1] for liquid equities, and 7 business days for all other instruments.
- If buy-in is not possible, the non-defaulting party can initiate one more attempt (the "deferral period"). Otherwise the buy-in will result in "cash compensation".
- SFTs with terms ≥ 30 business days are in scope.
- **The payment of the buy-in / cash compensation is asymmetrical and can only be paid in one direction**.

[1] As determined by Article 4(6)(b) of Regulation (EU) No 600/2014 (MiFIR)





## Key differences between ICMA Buy-in Rules and CSDR mandatory buy-ins

| ICMA Buy-in Rules | CSDR |
|---|---|
| Discretionary: can be initiated at any time from ISD+1 | Mandatory: must be initiated on ISD+4 (liquid equities) or ISD+7 |
| Non-defaulting party can elect time between notification and date of buy-in (4 to 10 days) | No defaulting party must start buy-in process following the extension period |
| Buy-in process can run indefinitely | Buy-in must be completed in 4 or 7 days, with option to attempt ('defer') for one more attempt |
| No requirement to appoint a buy-in agent | Requirement to appoint a buy-in agent |
| Buy-in differential (buy-in price vs original price) is paid in either direction between seller and buyer depending on which is higher/lower. | Buy-in differential payment is asymmetrical, and is only paid by the seller to the buyer where the buy-in price is higher. Where it is lower, the differential is "deemed paid". |
| Cash compensation is possible, but not prescribed. | Cash compensation is prescribed (and also asymmetrical) |
| Pass-on mechanism to provide for single buy-in to settle settlement chains | No pass-on mechanism |
| Applies to all firms trading under ICMA Rules (usually members) in 'international securities'. The ICMA Rules form part of the contractual trading agreements between member firms. | Applies to all transactions intended to settle on an EU/EEA CSD in transferable securities, money-market instruments, units in collective investment undertakings, and emissions allowances, which are admitted to trading or traded on a trading venue or cleared by a CCP. |

[1] Defined as a security intended to be traded on an international, cross-border basis (ie between parties in different countries), and capable of settlement through an international central securities depository or equivalent.

## The CSDR mandatory buy-in asymmetry

Level 1: Article 7(6)

> Without prejudice to the penalty mechanism referred to in paragraph 2, where the price of the shares agreed at the time of the trade is higher * than the price paid for the execution of the buy-in, the corresponding difference shall be paid to the receiving participant by the failing participant no later than on the second business day after the financial instruments have been delivered following the buy-in.

RTS: Article 35

> **Payment of the price difference**
>
> 1. Where the price of financial instruments referred to in Article 5(1) of Regulation (EU) No 909/2014 agreed at the time of the trade is lower than the price effectively paid for those financial instruments pursuant to Articles 27(10), 29(10), and 31(10), the failing clearing members, failing trading venue members or failing trading parties shall pay the price difference to the CCP, receiving trading venue members or receiving trading parties, as applicable.
> Where transactions are cleared by a CCP, the price difference referred to in the first subparagraph shall be collected from failing clearing members by the CCP and paid to the receiving clearing members.
>
> 2. Where the price of the shares agreed at the time of the trade is higher than the price effectively paid for those shares pursuant to Article 27(10), Article 29(10) and Article 31(10), the corresponding difference referred to in Article 7(6) of Regulation (EU) No 909/2014 shall be deemed paid.

* Footnote added by ICMA. This would normally be expected to read "lower", rather than "higher", to be consistent with market practice. In the case that the price agreed at the time of the trade is *higher* than the price paid for the execution of the buy-in, the corresponding difference is normally paid **by** the receiving party **to** the failing party.



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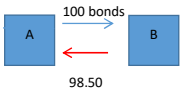
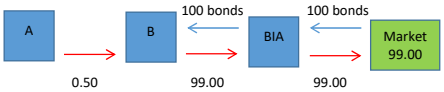
## CSDR mandatory buy-in

Original trade



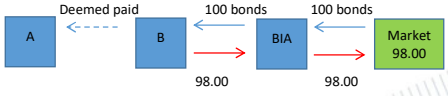

- In other words, the CSDR asymmetry has the potential to change the economics of the original trade

Buy-in at a higher price




| | A | B |
|---|---|---|
| P&L before buy-in | (0.50) | +0.50 |
| P&L after buy-in | (0.50) | +0.50 |
| P&L impact of buy-in | 0 | 0 |

Buy-in at a lower price *



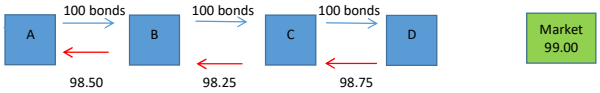

| | A | B |
|---|---|---|
| P&L before buy-in | +0.50 | (0.50) |
| P&L after buy-in | 0 | 0 |
| P&L impact of buy-in | (0.50) | +0.50 |

* This is the economic equivalent of the seller of bonds also writing a 'free' at-the-money put option which becomes active in the event of a buy-in. The purchaser is effectively long the put.

20

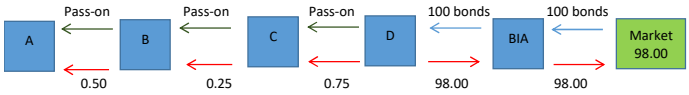
## The impact of the CSDR asymmetry on buy-in chains

Original trade



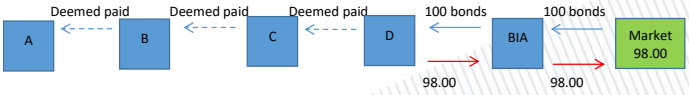

| | A | B | C | D |
|---|---|---|---|---|
| P&L | (0.50) | (0.25) | +0.50 | +0.25 |

Conventional buy-in with 'pass-on'




| | A | B | C | D |
|---|---|---|---|---|
| P&L before buy-in | 0 | (0.25) | +0.50 | (0.25) |
| P&L after buy-in | 0 | (0.25) | +0.50 | (0.25) |
| P&L impact of buy-in | 0 | 0 | 0 | 0 |

CSDR buy-in




| | A | B | C | D |
|---|---|---|---|---|
| P&L before buy-in | +0.50 | (0.25) | +0.50 | (0.75) |
| P&L after buy-in | 0 | 0 | 0 | 0 |
| P&L impact of buy-in | (0.50) | +0.25 | (0.50) | +0.75 |





## 4. Considerations for in-scope SFTs

## Buy-ins generally do not apply to SFTs because….

- From a market perspective, SFTs are not outright sales or purchases of securities, they are loans or borrows of securities.
- While SFTs may look like two separate transactions (a sale and a purchase), contractually they are single transactions.[1]
- The revenue (or profit and loss) generated from an SFT derives from the repo or lending rate (or fee) applied to the transaction, and not from market moves in the value of the underlying securities.
- Unlike outright cash trades, SFTs are margined. This can be in the form of variation margin, to ensure that the value of the cash loan remains in line with the value of the underlying securities, and also in the form of initial margin, through the application of haircuts.
- It is also important to remember that under the contractual agreements for SFTs (namely GMRAs and GMSLAs in the European context), there are no provisions to buy-in against a failing SFT. This is because in most scenarios it would make no economic sense to do so.

[1] From a legal perspective a SFT may be contractually structured as a title transfer arrangement, involving an outright sale and repurchase.



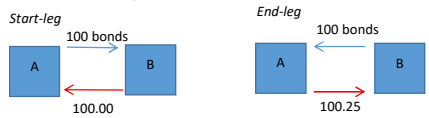


## Challenges of applying mandatory buy-ins to SFTs

- If you buy-in against the start-leg, does the end-leg remain valid?
- If a buy-in against the start-leg results in cash compensation, what happens to the end leg? Does that remain valid?
- How is the settlement of the buy-in/cash compensation determined? Is this based on the price assigned to the start-leg?
- How do you apply the asymmetry to buy-ins against SFTs?
- How do you account for haircuts in determining the appropriate buy-in/cash compensation differential payment? Does the asymmetry still apply in the case of haircuts?
- Are open trades (and 'open-like' trades) in or out of scope?
- What happens to open trades if they reach 30 business days?
- Will CCPs require separate netting pools for in- and out-of-scope SFTs?
- How do you manage the buy-in risk in a matched-book with both in- and out-of-scope SFTs?

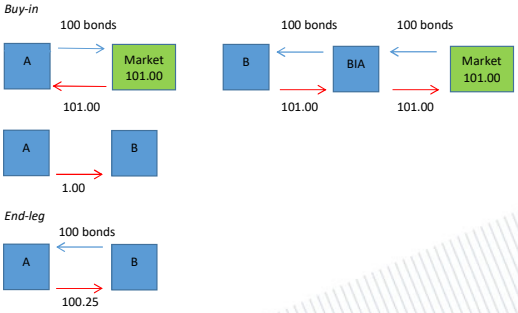
## How do you buy-in a start-leg?

### Original trade




| Orignal Transaction | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| SFT SL | +€100mm | -100mm XYZ bonds | SFT SL | -€100mm | +100mm XYZ bonds |
| SFT EL | -€100.25mm | +100mm XYZ bonds | SFT EL | +€100.25mm | -100mm XYZ bonds |
| Net | -€0.25mm | | Net | +€0.25mm | |

### Buy-in against start-leg




In this scenario the lending counterparty (A), will need to sell bonds in the market, once they are bought-in. A's risks relate to the buy-in premium (i.e. the difference between the buy-in price and prevailing market price).

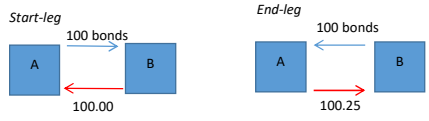
| Post CSDR buy-in | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| Sale | +€101mm | -100mm XYZ bonds | Buy-in | -€101mm | +100mm XYZ bonds |
| Buy-in differential | -€1mm | | Buy-in differential | +€1mm | |
| SFT EL | -€100.25mm | +100mm XYZ bonds | SFT EL | +€100.25mm | -100mm XYZ bonds |
| Net | -€0.25mm | | Net | +€0.25mm | |





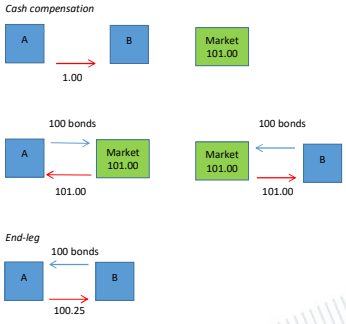
## What happens if the start-leg results in cash compensation?

### Original trade




| Orignal Transaction | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| SFT SL | +€100mm | -100mm XYZ bonds | SFT SL | -€100mm | +100mm XYZ bonds |
| SFT EL | -€100.25mm | +100mm XYZ bonds | SFT EL | +€100.25mm | -100mm XYZ bonds |
| Net | -€0.25mm | | Net | +€0.25mm | |

### Cash compensation against start-leg

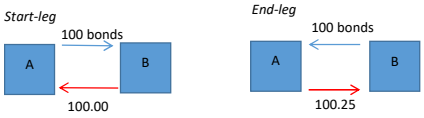



In this scenario there is no delivery/receipt of bonds, so B will be required to purchase bonds in the market, while A will need to sell bonds in the market. This creates market risks for both parties, related to the difference between the cash compensation reference price and their subsequent market transactions.

| Post CSDR cash compensation | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| Cash comp differential | -€1mm | | Cash comp differential | +€1mm | |
| Sale | +€101mm | -100mm XYZ bonds | Purchase | -€101mm | +100mm XYZ bonds |
| SFT EL | -€100.25mm | +100mm XYZ bonds | SFT EL | +€100.25mm | -100mm XYZ bonds |
| Net | -€0.25mm | | Net | +€0.25mm | |

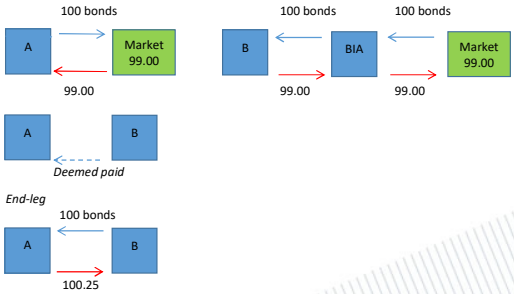
## Applying the CSDR asymmetry to SFTs

### Original trade




| Orignal Transaction | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| SFT SL | +€100mm | -100mm XYZ bonds | SFT SL | -€100mm | +100mm XYZ bonds |
| SFT EL | -€100.25mm | +100mm XYZ bonds | SFT EL | +€100.25mm | -100mm XYZ bonds |
| Net | -€0.25mm | | Net | +€0.25mm | |

### Buy-in against start-leg




As with outright cash trades, the asymmetry of the CSDR buy-in process creates additional downside market risks for the delivering SFT counterparty (and the opportunity for windfall profits for the receiving counterparty).

| Post CSDR buy-in | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| Sale | +€99mm | -100mm XYZ bonds | Buy-in | -€99mm | +100mm XYZ bonds |
| Buy-in differential | Deemed paid | | Buy-in differential | Deemed paid | |
| SFT EL | -€100.25mm | +100mm XYZ bonds | SFT EL | +€100.25mm | -100mm XYZ bonds |
| Net | -€1.25mm | | Net | +€1.25mm | |



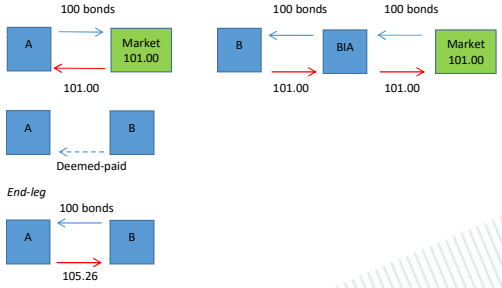


## CSDR mandatory buy-ins with haircuts

### Original trade


| Orignal Transaction | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| SFT SL | +€105mm | -100mm XYZ bonds | SFT SL | -€105mm | +100mm XYZ bonds |
| SFT EL | -€105.26mm | +100mm XYZ bonds | SFT EL | +€105.26mm | -100mm XYZ bonds |
| Net | -€0.26mm | | Net | +€0.26mm | |

### Buy-in against start-leg




Applying the CSDR buy-in process as written, without adjusting for haircuts, could result in significantly unusual economic outcomes. Again, this caused by the asymmetry.

| Post CSDR buy-in with haircut | | | | | |
|---|---|---|---|---|---|
| **A** | *Cash* | *Securities* | **B** | *Cash* | *Securities* |
| Sale | +€101mm | -100mm XYZ bonds | Buy-in | -€101mm | +100mm XYZ bonds |
| Buy-in differential | Deemed paid | | Buy-in differential | Deemed paid | |
| SFT EL | -€105.26mm | +100mm XYZ bonds | SFT EL | +€105.26mm | -100mm XYZ bonds |
| Net | -€4.26mm | | Net | +€4.26mm | |

## 4. Considerations for out-of-scope SFTs



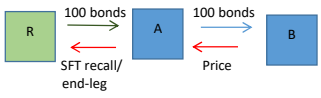


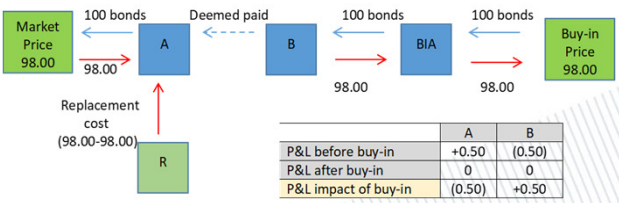
## The link between SFTs and cash trades: the impact of the asymmetry on failing end-legs

As discussed previously, while it is not possible to 'pass-on' a cash market buy-in under a GMRA/GMSLA, it may be possible to pass-on any buy-in costs through the mini close-out mechanism, since it could be argued that the buy-in cost is effectively the cost of replacing the securities.

Under CSDR, the risks of buy-ins increase, thus the ability to pas-on buy-in costs through a mini close-out will be tested more frequently. Also, even if it is possible to pass-on regular buy-in costs through the mini close-out mechanism, it will not be possible to pass-on any costs resulting from the CSDR asymmetry.

So lenders of securities will face much higher risks and potential losses in the event of failing SFTs.




| | A | B |
|---|---|---|
| P&L before buy-in | +0.50 | (0.50) |
| P&L after buy-in | 0 | 0 |
| P&L impact of buy-in | (0.50) | +0.50 |

## Conclusion

- CSDR Settlement Discipline (due to come into force in Septmber 2020) creates a regulatory obligation for trading parties to buy-in failing (selling) counterparties.
- The regulatory obligation to buy-in is based on the jurisdiction of the (I)CSD and the nature of the underlying security – regardless of the domicile or jurisdictions of the trading parties.
- The regulation sets out very precise guidelines for the buy-in process, including timings.
- The buy-in mechanism has an asymmetry in how the buy-in cash flows are settled. In many cases this will create windfall profits for the failed-to party and additional market risks and losses for the failing party. This is broadly understood to be the unintended consequence a drafting error in the Level 1 text that cannot be changed.
- Mandatory buy-ins will apply to SFTs (≥ 30 business days' term). However, there are a number of complications and ambiguities as to how buy-ins can be applied, which will need to be addressed.
- Due to the inherent relationship between cash and SFT markets, the regulation will also have a significant indirect impact on repo and securities lending, not least as a result of the asymmetry.
- The CSDR mandatory buy-in regime is widely expected to have disproportionate negative impacts with respect to European capital market efficiency, liquidity, and stability.





## Annex I: Resources and useful links

Related ICMA Papers:

[CSDR Settlement Discipline: mandatory buy-ins]
July 2018 (Information Brochure) [updated August 2019]

[How to survive in a Mandatory Buy-in World]
June 2018 (Discussion Paper)

[CSDR Mandatory Buy-ins and Securities Financing Transactions]
October 2018 (Discussion Paper)

More information and resources can be found on the dedicated CSDR-SD Webpage on the ICMA website:
https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/Secondary-Markets/secondary-markets-regulation/csdr-settlement-discipline/





Regulatory texts:

CSD- Regulation (EU) No 909/2014

Delegated Regulation ("Level 2") 25.5.2018

CSDR Frequently Asked Questions (September 2014)

## Annex II: What is ICMA doing about CSDR-SD?





## What is ICMA doing about CSDR buy-ins? Implementation

- Updating the **ICMA buy-in rules** to be CSDR compliant:
  - Providing a contractual framework and market best practice to support implementation
  - Providing contractual solutions to some of the regulation's more problematic challenges
- **Addressing the asymmetric payment provisions** for buy-in and cash compensation
  - Working with ESMA to provide Q&A that allows for symmetrical payments through contractual agreements (such as the ICMA buy-in rules)
- Working with the broader industry to design and propose a workable **pass-on mechanism**
- Working with ISLA to establish **best practice for SFTs** in the case of fails
- Working with ISLA to propose appropriate **exemptions for certain SFTs**:
  - Open trades (including once they have reached 30 business days)
  - Basket trades (including triparty and DBV)

## What is ICMA doing about CSDR buy-ins? Advocacy

- Raising awareness of scope, details, and potential implications.
  - In particular non-EU entities and smaller buy-sides
- Continuing advocacy with regulators and policy makers with a view to delaying/amending the CSDR mandatory buy-in provisions.
  - ICMA's position is that cash penalties should be made more punitive as a less disruptive alternative to applying the mandatory buy-in regime
  - ICMA is planning to undertake a 2nd Bond Market Impact Study in fall 2019 to coincide with the CSDR 5 year review (following the previous study of 2015)

Details and initiatives of the ICMA CSDR-SD Working Group can be found here:
https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/Secondary-Markets/secondary-market-practices-committee-smpc-and-related-working-groups/csdr-sd-working-group/

International Capital Market Association

**ICMA Professional Repo Market & Collateral Management Course**
**Frankfurt 11-12 September 2019**

# SFTR

**Richard Comotto**
ICMA Centre
University of Reading
United Kingdom

ICMA CENTRE THE BUSINESS SCHOOL FOR FINANCIAL MARKETS

1

## SFTR

### topics

- what is SFTR?
- SFT disclosure requirements
- collateral re-use/re-hypothecation requirements
- SFTR reporting scope
- SFTR data requirements
- CCP margin reports
- collateral re-use reports



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# what is SFTR

- SFTR = Securities Financing Transactions Regulation
- *Regulation (EU/2015/2365)…on transparency of securities financing transactions & of reuse & amending Regulation (EU) No.648/2012* [EMIR]
- intended to improve transparency to allow:
  - assessment by regulators of systemic risks of excessive leverage, risk concentration, pro-cyclicality, interconnectedness
  - monitoring by regulators of any migration of traditional banking into shadow banking due to regulatory reforms
  - counterparties to analyse & avoid risks arising from re-use of their assets
- implements FSB recommendations





# what is SFTR

## SFT has three pillars

- disclosure to investors [Articles 13 & 14]
- information to investors about & consent to re-use or re-hypothecate collateral [Article 15]
- reporting [Article 4]

## SFT disclosure requirements

- effective July 2017
- information to be included in regular reports & in prospectuses
- UCITS management companies to inform investors of use made of SFTs & total return swaps (TRS) in semi-annual & annual reports
- AIF (alternative investment fund) managers to inform investors about use of SFTs & TRSs in annual reports



## collateral re-use/re-hypothecation requirements

- SFTR imposes regulatory (but not legal) conditions for re-use of collateral received through title transfer or security interest under all collateral arrangements (not just SFTs)
- effective July 2017
- **information requirement**
  - collateral-giver should be duly informed in writing of risks & consequences (at least in event of default by collateral-taker) that may be involved in concluding a collateral arrangement
  - standard SFTR Information Statement published by ICMA & others ISLA
- **consent requirements**
  - right of re-use subject to collateral-giver having "granted its prior express consent" to right of re-hypothecation to counterparty to a security collateral arrangement or to proving collateral by title transfer
  - exercise of right of re-use subject to:
    - re-use undertaken in accordance with terms of arrangement
    - collateral transferred from account of seller/borrower
  - GMRA & GMSLA are express agreements

# SFTR reporting scope

- SFTR requires
  - complete, accurate, timely reporting of new transactions/positions & any life-cycle events plus changes in collateral
  - reporting at legal entity level, which requires consolidation of data from across entities
  - several classifications of parties & collateral
  - mandatory use of UTIs, LEIs, ISINs
  - reporting to trade repositories
- ESMA requires:
  - dual-sided reporting & matching of almost 75% of fields in reports
  - no enrichment of data by trade repositories
  - reports reflecting books & records --- booking models in line with contractual obligations
  - view of breaks to see where there are risks





# SFTR reporting scope

## definition of SFTs in SFTR

- SFTs under SFTR are:
  - repurchase transactions
  - buy/sell-backs
  - securities lending & borrowing + commodities lending & borrowing
  - margin lending
- definition of repo is wrong & distinction between repurchase transactions & buy/sell-backs unnecessary
- excludes synthetics although disclosure required of use of TRS to clients by fund managers

# SFTR reporting scope

## implementation timeframe

- four waves:
  - go-live for banks & investment firms = 11 April 2020 (Easter Saturday)
  - go-live for CCPs & CSDs = 11 July 2020 (Saturday)
  - go-live for buy-side = 11 October 2020 (Sunday)
  - go-live for corporates = 11 January 2021
- dates may be shifted to avoid Easter





# SFTR reporting scope

## back-loading data

- reporting required of most historic transactions to allow positions to be calculated about six months after reporting start-dates
- historic open transactions still live 180 days after the start-dates
- historic fixed-term transactions expected to be live 180 days after the start-dates

# SFTR reporting scope

## reporting deadlines

- transaction/position reporting deadline = T+1
- exceptions
  - by S+1 --- collateral reports when collateral allocation is unknown by T+1, including cross-border & tri-party SFTs
  - on S+1 --- end-of-day collateral update reports for each transaction & position
  - on S+1 --- re-use of collateral reports
  - on S+1 --- CCP margin reports

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# SFTR reporting scope

## types of report --- Action Types

- every report must include an Action Type describing the type of report
- 10 Action Types but not all relevant to all SFTs
  - new transaction --- **NEWT**
  - new position --- **POSC**
  - modification --- **MODI**
  - termination --- **ETRM**
  - collateral update --- **COLU**
  - valuation update of loaned securities --- **VALU**
  - margin --- NEWT & **MARU**
  - re-use --- NEWT & **REUU**
  - correction --- **CORR**
  - error --- **EROR**
- sequencing can be critical

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# SFTR reporting scope

## SFTR data sets

- transactions & positions
  - counterparty
  - loan
  - collateral
- CCP margin
- re-use of collateral
- some fields are always mandatory, some are mandatory in defined circumstances (conditional), some are to be reported if relevant (optional), some do not apply in defined circumstances --- regulators do not want under- or over-reporting
- see Validation Rules

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# SFTR reporting scope

for reference

## SFTR data sets

| | repurchase transactions | buy/sell-backs | securities lending | margin lending | total |
|---|---|---|---|---|---|
| counterparty | 18 | 17 | 18 | 12 | 18 |
| loan | 64 | 42 | 76 | 37 | 99 |
| collateral | | | | | |
| margin | 20 | 20 | 20 | n/a | 20 |
| re-use | 11 | 11 | 16 | 18 | 18 |
| total | 113 | 90 | 20 | n/a | 155 |

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# SFTR reporting scope

## scope of transaction/position reporting obligation

- **general rule**
  - entities trading from inside EU, including branches of non- EU firms
  - branches of EU-based entities located outside EU

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# SFTR reporting scope

## scope of transaction/position reporting obligation

- **exempt entities**
  - entities located outside EU, except branches of EU firms
  - subsidiaries of EU entities located outside EU

  } entities incorporated & located outside EU
  - EU central banks & debt management offices
  - BIS
- **exempt SFTs**
  - intra-company transactions
  - transctions with EU central banks (but reportable under MiFIR)
  - note that repos with DMOs & BIS are not exempt from reporting
- **delegation**
  - small EU-based non-financials --- obligation delegated to EU financial counterparty
  - UCITS & Alternative Investment Funds --- obligation delegated to managers

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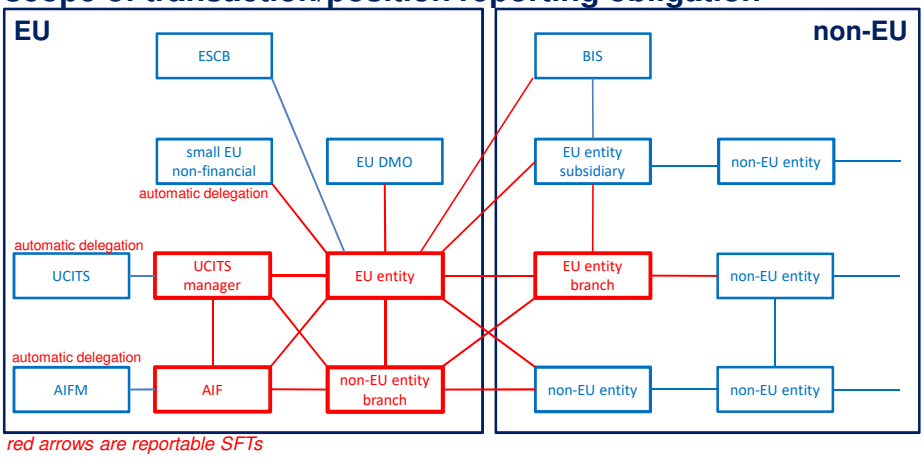
# SFTR reporting scope

## scope of transaction/position reporting obligation




*red arrows are reportable SFTs*
*red boxes are reporting counterparties*

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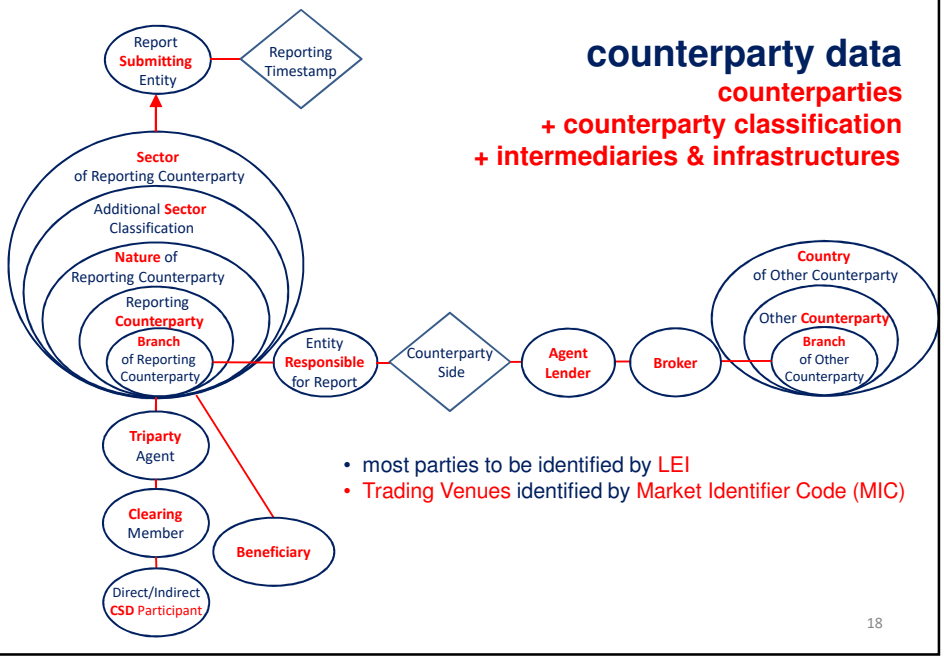
# SFTR data requirements




**counterparty data**
**counterparties**
**+ counterparty classification**
**+ intermediaries & infrastructures**

- most parties to be identified by LEI
- Trading Venues identified by Market Identifier Code (MIC)

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# SFTR data requirements

## loan data

- can report transactions or CCP positions --- but position reporting not possible under rules
- identify each transaction with a UTI
- legal framework
  - Master Agreement Type
  - Method Used to Provide Collateral --- always title transfer for true repo
  - Availability of Collateral for Reuse --- always possible for true repo except for UCITS
- term
  - fixed-term, open, evergreen, extendible
  - transaction & settlement dates
  - termination option date, termination notice period
- other transaction parameters
  - amounts of cash & collateral
  - repo rates --- fixed or floating





# SFTR data requirements

## life-cycle events

- modifications
  - changes in data given in a previous report other than collateral, margin & re-use data
  - to be reported in chronological order
  - series of reports to be corrected if there is an error
  - linked to original report by UTI
- terminations
  - termination of fixed-term or open transactions
  - linked to original transaction by UTI

# SFTR data requirements

## collateral data

- collateral is generally reported as sub-report of a new report
- but sometimes it will be reported separately & later:
  - when collateral allocation is unknown in time to include in new report for T+1
  - when there are changes in composition & value of collateral from end of one day to subsequent date
  - for variation margin for uncleared repos against net exposure --- ICMA mechanism proposed to ESMA
- separate collateral reports can be made a special collateral update report by S+1

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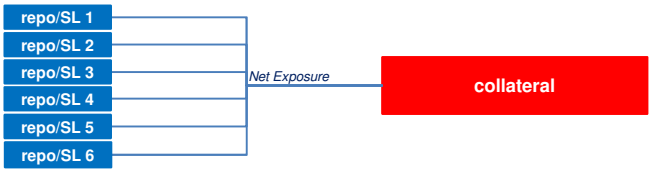
# SFTR data requirements

## collateral data --- level of reporting

**trade-level collateralisation**


**net exposure collateralisation**

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# SFTR data requirements

## level of reporting --- net exposure collateralization

- one pool of collateral hedging multiple SFTs
- applies to:
  - GC financing facilities (Eurex Repo EGCP, LCH SA €GCPlus, LCH Ltd £GC)
  - JP Morgan tri-party repo
  - variation margin on uncleared repos

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# SFTR data requirements

## collateral data

- securities
  - ISIN, maturity, issuer LEI, issuer jurisdiction
  - nominal amount & market values
  - price & currency
  - haircut
  - classification
    - CFI code
    - investment grade or not, not rated, not applicable
    - class of issuer under FSB SFT Global Data Standards
- cash
  - common in securities lending
  - occasionally temporarily used in repo
    - tri-party repo
    - some corporate events
    - to secure failed margin return (GMRA Cash Equivalent Amount)
  - amounts & currency

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# CCP margin reports

## scope of reported CCP margin

- applies to centrally-cleared repos only
- initial margin, variation margin & excess collateral but not default fund contributions
- margin reports are of entire outstanding balance of CCP margins given or received between:
  - clearing members & CCPs
  - clearing members & clearing clients
- CCP will supply data to clearing members

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# SFTR collateral re-use reports

## what is re-use of collateral

- SFTR implementation rules differs from SFTR & FSB
- implementation rules defines re-use in:
  - being limited to collateral received & posted through SFTs only (rather than through all collateral arrangements)
  - excluding re-use in outright sales
  - including loaned securities in the list of collateral
- where assets received & re-used as collateral are 'distinguishable' from same assets received & re-used as own assets, rules require re-use to be reported in Value of Re-Used Collateral
- where re-used collateral cannot be linked to specific SFTs, Estimated Re-Use is calculated using an FSB formula

$$\text{collateral}^{\text{reused}} = \left( \frac{\text{collateral}^{\text{received eligible for reuse}}}{\text{collateral}^{\text{received eligible for reuse}} + \text{assets}^{\text{own}}} \right) \text{collateral}^{\text{posted}}$$

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# SFTR reporting requirements

**A simple repurchase transaction as seen by the seller**

report fields
1.1 reporting timestamp
2.98 Action Type

Other
1.13 beneficiary
1.14 tri-party agent
1.15 broker
1.16 clearing member
1.17 CSD/indirect participant
1.18 agent lender
2.1 UTI
2.2 RTN
2.4 type of SFT
2.5 cleared
2.6 clearing timestamp
2.7 CCP
2.8 trading venue
2.9 master agreement
2.10 other agreement
2.11 agreement version
2.19 DBV indicator
2.73 net exposure
2.74 value date of collateral
2.76 cash collateral
2.77 cash collateral currency
2.97 portfolio code
2.99 level