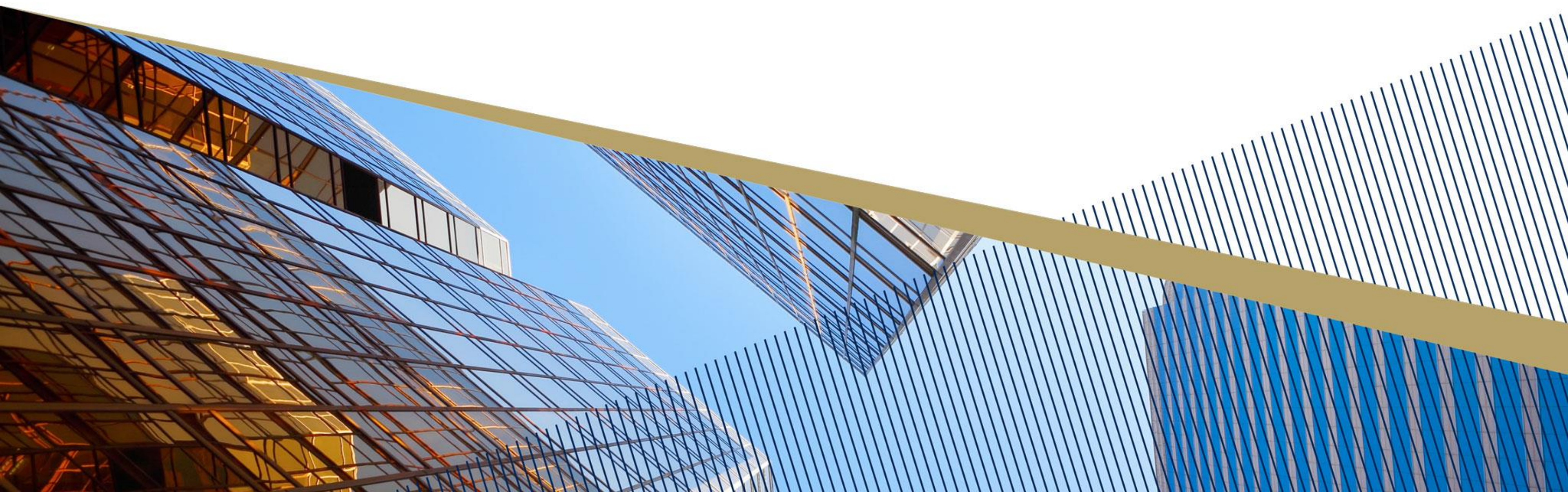
ICMA
International Capital Market Association

ICMA Workshop: Professional Repo and Collateral Management
1-2 June 2017



Valuing collateral in an event of default

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Valuing collateral in an Event of Default

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Presented To: International Capital Market Association

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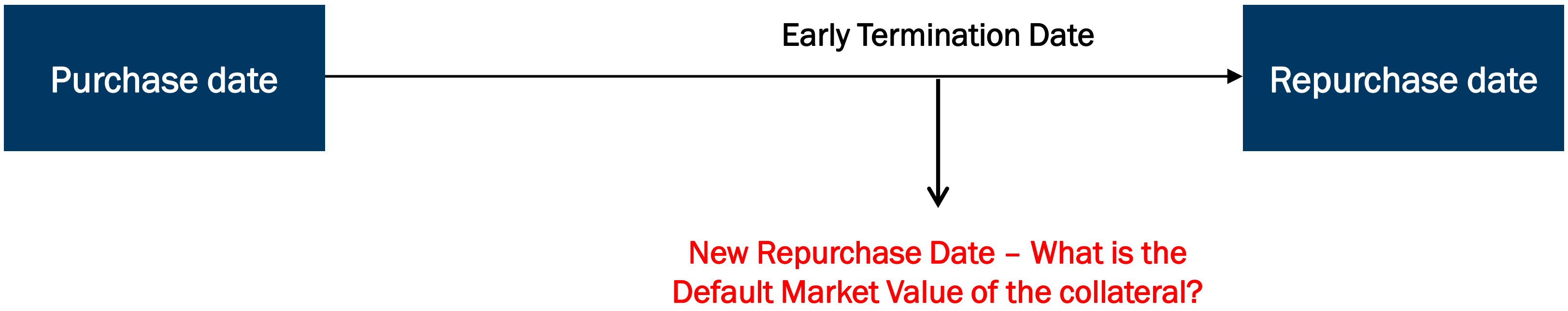
Relevant GMRA clauses related to an Event of Default

Early Termination in a repo transaction as per the GMRA 2011



- An Early Termination Date occurs within **20 days** of an Event of Default.
- If the GMRA specifies that the Automatic Early Termination clause applies, then the Early Termination Date is set at the time **immediately preceding the Act of Insolvency.**

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What is an Event of Default [GMRA 2011, 10 (a)]

- An Event of Default occurs when either party:
  - fails to pay the Purchase/Repurchase Price on the applicable date.
  - fails to deliver the Purchased or Equivalent Securities on the relevant date and the Parties have specified that this clause applies.
  - fails to pay any sum that is due by them.
  - fails to make a Margin Transfer.
  - is subject to an Act of Insolvency.
  - makes or has made any incorrect or untrue representations.
  - admits to the other that it is unable to or intends not to perform any of its obligations.
  - is declared in default or is suspended or expelled from participation in any securities exchange or dealing in securities by a Competent Authority.
  - fails to perform any other of its obligations and does not remedy this within 30 days after notice is given by the non-Defaulting party.

Designation of an Early Termination Date and change of Repurchase Date [GMRA 2011, 10 (b) and 10 (c)]

- This takes place after an Event of Default has occurred and is continuing.
- The non-Defaulting Party gives notice to the Defaulting Party within 20 days of the Event of Default.
- The non-Defaulting Party designates a specific day after the notice is given as an Early Terminate Date in respect of all outstanding transactions.
- If the Parties have agreed at the outset that an Automatic Early Terminate will take place, then the Early Terminate Date is set to the time immediately preceding the Act of Insolvency.
- If an Early Termination Date occurs, the Repurchase Date for each Transaction is moved back to the Early Termination Date.
- All Cash Margins, Equivalent Margin Securities and Cash Equivalent Amounts shall be deliverable or **payable on the Early Termination Date**.

Default Market Value at Early Termination Date [GMRA 2011, 10 (d)]

- The Default Market Value of the Equivalent Securities, Margin Securities, Cash Margin, Repurchase Prices and Cash Equivalent Amounts to be paid by each party is established by the non-Defaulting Party for all transactions as at the Early Termination Date.
- An account of the amounts due by each party are **set off against each other**, and only the balance of this is payable. All sums that are not denominated in the Base Currency are **converted at the Spot Rate** (obtained from a pricing source or quoted by a bank in the London interbank market).
- As soon as reasonably practicable after effecting the calculation, the non-Defaulting Party must provide the Defaulting Party a **statement showing in detail the calculations** and specifying the balance payable by one party to another.
- This balance **will be due and parable on the Business Day following the day this statement is provided.** Interest will **accrue** on this amount for the **actual number of days** during the period **including the Early Termination Date,** but **excluding the date of payment.**

Defined terms in the Default Market Value clause of the GMRA [GMRA 2011, 10 (e)]

Appropriate Market	The market which is the most appropriate market for Securities of that description, as determined by the non-Defaulting Party	GMRA 2011, 10 (e) (i)
Deliverable Securities	Equivalent Securities to be delivered by the non-Defaulting Party.	GMRA 2011, 10 (e) (ii)
Net Value	The fair market value of Securities net of transaction costs. Determined using pricing sources including traded prices and using prices for securities with similar maturities, terms and credit characteristics	GMRA 2011, 10 (e) (iii)

Defined terms in the Default Market Value clause of the GMRA [GMRA 2011, 10 (e)] - continued

Receivable Securities	Equivalent Securities to be delivered to the Defaulting Party	GMRA 2011, 10 (e) (iv)
Transaction Costs	Reasonable costs, commissions, fees and expenses incurred or reasonably anticipated in connection with the purchase of Deliverable Securities or sale of Receivable Securities	GMRA 2011, 10 (e) (v)

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What is the Default Market Value [GMRA 2011, 10 (f)]

- If the non-Defaulting Party has **sold** an **identical type** of a Receivable Securities or **purchased** an identical type of a Deliverable Securities (which also forms part of the same issue), the Default Market Value is the **net proceeds or aggregate costs** of this sale/purchase.

- If the non-Defaulting Party has received **two or more quotations** in respect of the Securities in the "Appropriate Market" in a commercially reasonable size, the Default Market Value is the **average of the quotes** received net of Transaction Costs. These prices are adjusted in a commercially reasonable manner to **reflect accrued coupons** that are not reflected in the prices quoted. The valuation is, therefore, **dirty.**

- If the non-Defaulting Party has acted in good faith and attempted but been **unable to sell or purchase Securities** or has been unable to obtain quotes and has determined that it would not be commercially reasonable to transact at such quotes, the Default Market Value is determined as the **Net Value of the relevant Securities.**

Valuation in the context of the Default Market Value

Issues arising after the sale of collateral

- The Default Market Value can be based on the prices secured during the sale of collateral.

- This does not absolve the non-Defaulting Party of all blame.

- Issues that arise could revolve around the negligence of the non-Defaulting Party to secure the best prices for its collateral.

Determine the "Appropriate Market"…

- The specific nature and feature of the securities and the overall composition of the portfolio and prevailing market conditions;
- The various markets and exchanges on which the non-Defaulting party could have executed trades for the securities;
- The non-Defaulting party's own limitations on accessing the market; and
- The opportunity to sell the entire securities portfolio as a whole, by asset class or by security.

Market depth

Location of market

Consider the characteristics of the portfolio/securities...

- % of issuance held
- Maturity
- Guarantee
- Unsecured / secured
- Size of the portfolio
- Currencies
- Availability of documents
- Portfolio level default correlation
- Size of the position
- Industry
- Coupon formula
- Weighted Average Rating of the portfolio
- Seniority
- Exchange traded / OTC
- Trading history
- Issuer location
- Vanilla / exotic
- Embedded options
- Liquidity
- Ratings

Consider prevailing market conditions…

- Risk expectations and aversion in general
- Volatility
- Haircuts
- Drying up of liquidity
- Widespread defaults, downgrades and/or unwinding of transactions and firms
- Idiosyncratic vs. systemic risk

Consider other factors…

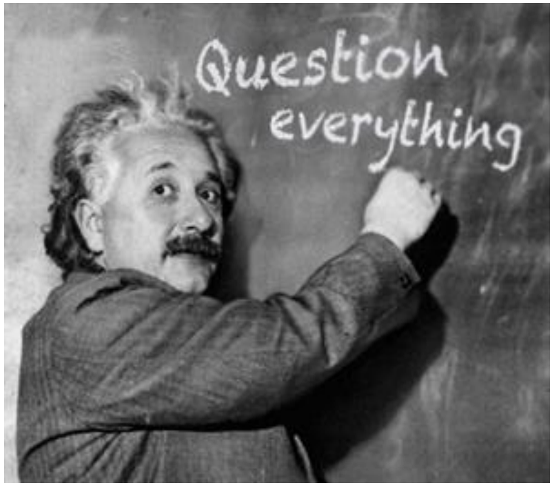
- Bid-offers
- Intraday price ranges
- Lack/reliability of market data (e.g. stale prices, indicative quotes)
- Portfolio-level or security-level sales/valuations
- Chosen method of liquidation (e.g. market impact vs. opportunity cost)
- Difficulty of selling a non-homogenous, exotic portfolio when risk aversion and selling pressure increase
- Liquidation period
- Reserving for market /liquidity /credit risk
- Identity of buyer/seller
- Funding costs

Choose valuation methodology

Mark to Market	calibrate a market accepted valuation model, by reference to similar instruments listed on an exchange or OTC market.
Quotation	by seeking quotations on the asset at issue from dealers (such as the "Market Quotation" method of ISDA) or quotations on similar assets, or for calibrating a market accepted valuation model.
Mark to Model	the absence of market prices of financial instruments, one can use an accepted valuation model, which may not be calibrated to market expectations and will require making assumptions about the inputs used in the model. There is an element of judgment under this approach.
Hybrid	by using a mix of the three approaches above. There is necessarily in this case a higher degree of judgment and assumptions on the part of the determining party.

Each of these methods will require different assumptions or inputs, and within each method a range of assumptions could be used. The method chosen should consider market expectations to the extent that the circumstances allow.

Questions?



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Coffee break

Leverage Ratio and repo

Oliver Deutscher, Head of Money Market, Repo and Collateral Trading Vice President/ Treasury, DZ BANK AG

ERCC Professional Repo Market and Collateral Management Course

Basel III/ Leverage Ratio and its impact on repo markets

London, June 1-2, 2017

Oliver Deutscher

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Agenda

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Leverage Ratio: Background and recent Timline

Today

2014
- 01.01.2014: EU Implementation LR- Reporting
- = > based on Basel Committee introduction of leverage ratio in December 2010

2015
- 01.01.2015 EU-Implemen-tation LR-Publication & adjustments LR-calculation basis BCBS 270

2016
- April 2016: BCBS d365 consultation on Leverage Ratio calibration and BCBS 364 Frequently asked questions on Basel III LR framework

2017
- Process of revisions and calibrations to BCBS d365

2019
- CRR II effective date as Pillar 1 measure on 1.1.2019
- plus 2yrs after CRR II activation

2021
- CRR II Go-live with adjusted calculations
- Reporting frequency according to financial statements or quarterly for large banks

During 2017
LR-final adjustments and appropriate calibration

1.1.2019
3% = > LR as additional, binding minimum requirement ratio in Pillar 1

Leverage Ratio: Background and Timline
Two objectives of Basel‘s Introduction of LR in 2010*

I.

- Restrict built-up and excess leverage in the banking sector helping to avoid potential negative impact on broader financial system & the economy

II.

- Reinforce risk-based requirements with a simple, non-risk based backstop measure

* Basel Committee on Banking Supervision/ Basel III: A global regulatory framework for more resilient banks and banking systems , Dec.2010 (rev June 2011) chapter V.Leverage Ratio , page 61 - 63

Leverage Ratio – Background and Timeline
Basel's BCBS 270* and Basel d365** aiming at…

BCBS & CRR

- Simple & complimentary to Basel's risk-based capital framework
- Non-risk based measure to restrict built up of leverage potential as a „backstop"
- Easy to calculate and therefore helpful indicator to compare regulated entities

EBA

- ITS (Implementing Technical Standards) for uniform reporting by EBA on Supervisory Reporting
- Harmonising disclousures of LR across the EU
- EBA-Op-2016-13 Report on the Leverage Ratio Requirements under Article 511 of the CRR*** conducted Impact study on selected market segments fullfilling LR requirements

ESRB

- ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector (ESRB(2014a)) advice but not binding how to implement leverage ratio
- Intention to support macroprudential authorities in the EU to understand, inform & analyse BCBS and EBA's work on leverage ratio implementation and its impact on financial sector.
- Could provide further ideas e.g.: stronger leverage ratio requirements for G-SIBs
- Analysis of microprudential effectiveness and impacts

- *https://www.bis.org/publ/bcbs270.htm
- **https://www.bis.org/bcbs/publ/d365.htm
- ***https://www.eba.europa.eu/regulation-and-policy/leverage-ratio

Excursus: Accounting of Repo (classic) Transaction‘s

- In Europe, a repo must be accounted for in the standard way. This follows the principle that balance sheets are intended to measure the value and risk of a company, not the legal form in which it has structured its transactions.

- In a repo, as the seller in a repo commits to repurchase the collateral at a fixed future repurchase price, he retains the risk and return on that collateral. Accordingly, the collateral remains on the balance sheet of the seller, even though he has sold legal title of the collateral to the buyer. The logic of this accounting treatment is confirmed by the consequence that, because the cash paid for the collateral is added as an asset to the seller’s balance sheet (balanced on the liability side by the repayment due to the buyer at maturity), this will expand, thereby signalling that the seller has increased his leverage by borrowing.

- In order to make it clear to the reader of a balance sheet which assets have been sold in repos, the **I**nternational **F**inancial **R**eporting **S**tandards (IFRS) require that securities out on repo are reclassified from “investments” to “collateral” and are balanced by a “collateralised borrowing” liability.*

*http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/frequently-asked-questions-on-repo/37-is-repo-used-to-remove-assets-from-the-balance-sheet/

Accounting of Repo/ Seller (classic) Transaction = Lengthening Balance Sheet

- Starting balance sheet **<u>of Party B (Seller)</u>**
- **<u>Party B = C</u>**ash Taker = Seeking Funding
- Secured financing of securities
- Repo out 100Mio.securities

Party B Balance Sheet before Repo Trade

Assets		Liabilities	
Cash	50	150	Capital
Bond	100		
	150	150	

+ 100

+ 100

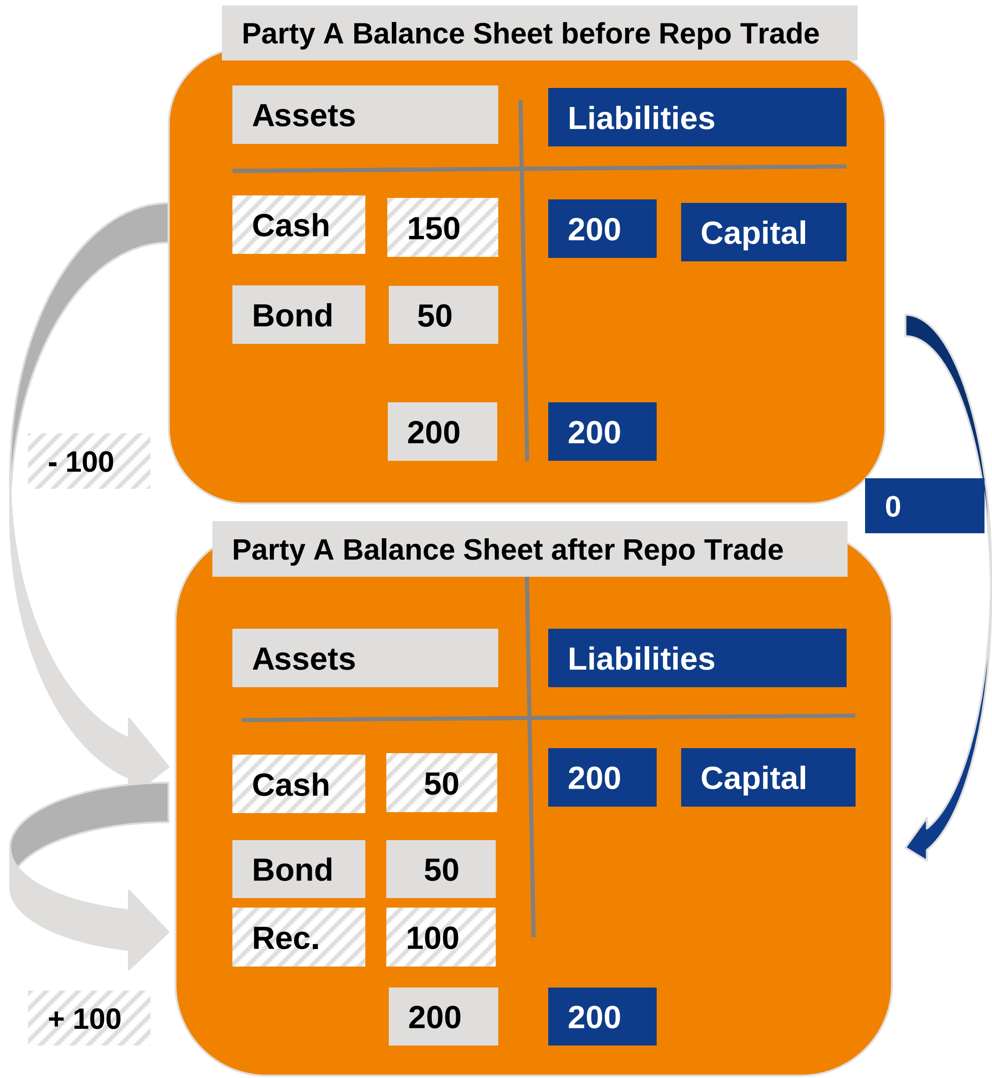
Party B Balance Sheet after R-Repo Trade

Assets		Liabilities	
Cash	150	150	Capital
Bond	100	100	Liab.
	250	250	

- **<u>On - balance</u>** - sheet transaction for Party B
- Party B provides collateral
- Accounting seen as collateralised loan
- Repo interest paid at maturity
- Term of repo – in general – ON to 1Yr
- **Bond position not affected for Party B**
- Bond risk position stays at Party B
- **<u>Increase of Liabilities of + 100Mio.</u>**
- **<u>Increase Asset-Side Cash/Liquidity +100Mio.</u>**
- **Result is balance sheet lengthening and leverage**

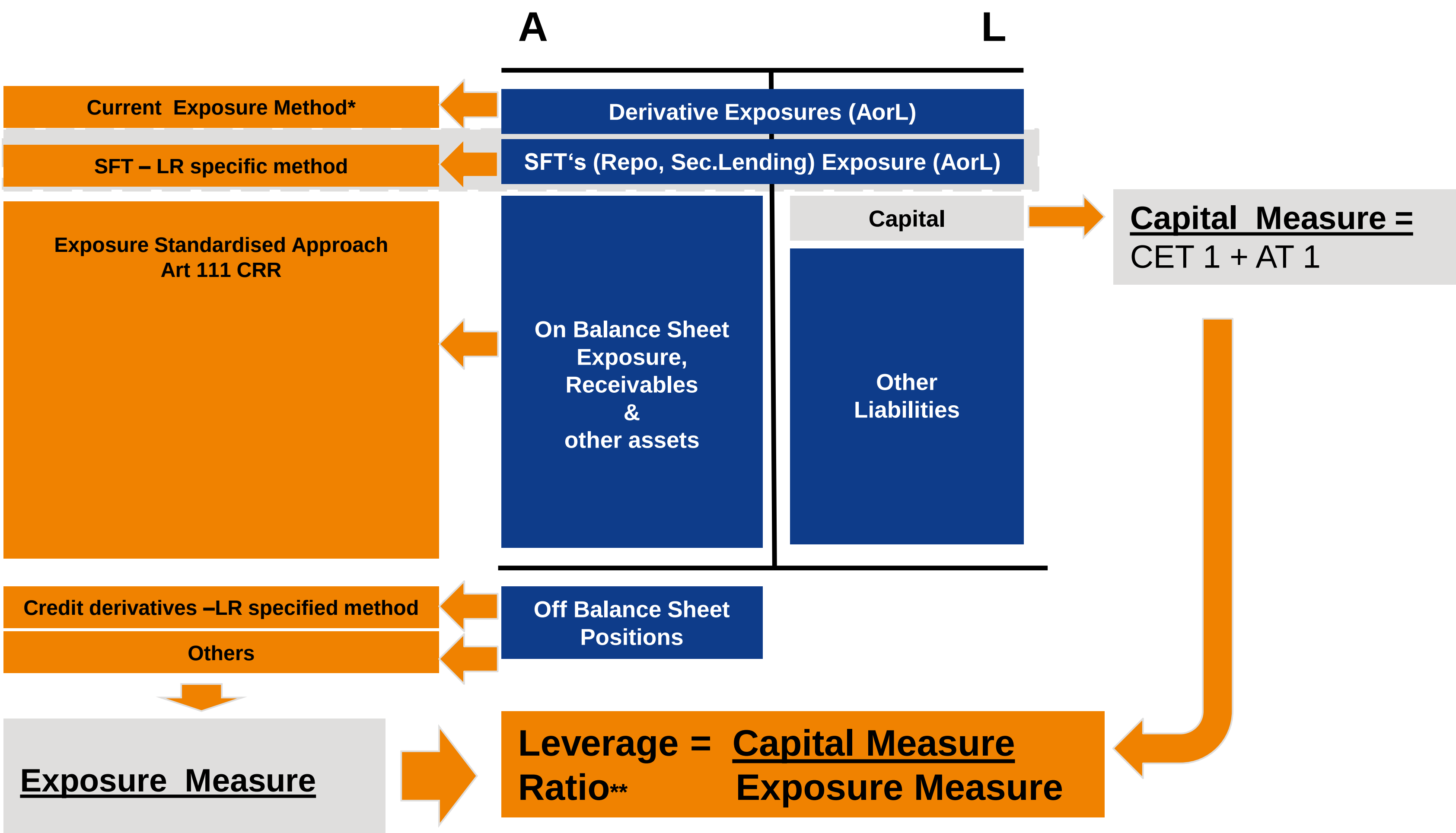
Accounting of Reverse–Repo/Buyer Transaction = Blance Sheet Neutral

- Starting balance sheet **<u>of Party A</u>**
- **<u>Party A = C</u>**ash Provider = Seeking Investment Opportunities
- Lending 100Mio.Liquidity
- Reversing-in securities e.g.: Short - Covering



- **<u>On - balance - sheet transaction for Party A</u>**
- Party A provides cash/ liquidity
- Accounting seen as **<u>collateralised loan</u>**
- Party A secured investment, providing financing of 100Mio.
- Repo interest received at maturity
- Term of repo – in general – ON to 1Yr
- No change in bond/ security position at Party A
- Increase of +100Mio.Receivables
- **Neutral balance sheet = > only swaping cash/liqudity position into receivables**

Leverage Ratio: Basic Structure



- * in 2020 or later: Standardised Approach for measuring counterparty credit risk (SA – CCR)
- ** CRR – Capital Requirement Regulation , Article 429, Calculation of the leverage ratio
- AorL = Assets or Liabilities

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Leverage Ratio: Balance Sheet Netting* Exceptions for SFT's to reduce exposure measure IF…

+

= > Cash payables and cash receivables in *SFTs ARE NETTABLE* with the same counterparty if:

- Transaction has the same explicit final settlement date

- Legally enforcable with right to set off amounts in event of default, insolvency and bankcruptcy

- Transactions need to settle with/via same settlement system to avoid mismatches / fails

−

= > Open repos with no explicit end date but can be unwound at any time by either party **are not eligible for netting** due to not meeting condition of having an explicit settlement date

= > Netting for derivatives and SFT's included in a cross netting agreement are **not permitted**

- *BCBS d364 Frequently asked questions on the Basel III leverage ratio framework, April 2016 (update of FAQs published in July 2015)

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Leverage Ratio‘s* Impact on Market Making Capacity, Repo Trading and Market Liquidity

	Qualitative Results	Quantitative Results	Impact on	Outlook
How does regulation affect market making capacity, market liquidity and market maker inventories	▪ *Balance sheet constraints* ▪ *Changing regulatory requirements* ▪ *No single specific reason identified from survey* ▪ *No specific correlation drawn if drop in market liquidity due to regulation or reduction (risk-off) in risk appetite.*	▪ *Only narrow dataset from Q1,2014 used* ▪ *Very low to no impact seen in correlation LR to volume of market makers‘ inventories* ▪ *Currently no agreed empirical model in place to survey impact of LR* ▪ *Reduced market participants*	▪ *Increase capital charge* ▪ *Reduce balance sheet but not specifically in repos* ▪ *Pressure on profits*	▪ *Neutral & depending on future survey of participants*
Leverage Ratio, Repo & Market Liquidity	▪ *Increase confidence between market participants* ▪ *Potential resiliance during market stress periods* ▪ *Market participants behaviour changing Banks with higher LR hold less trading assets*	▪ *Based on annual datasets period 2010-2014* ▪ *Based on regression analysis* ▪ *missing recent datasets between years 2014 - 2017*	▪ *Deleveraging balance sheet and relative size in trading activities* ▪ *LR less to no impact on trading assets* ▪ *LR less to no impact on trading repos*	▪ *Rather negative*

* Please see: EBA Report on the Leverage Ratio Requirements under Article 511 of the CRR pages 247ff.

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Leverage Ratio's* Impact on Market Making Capacity, Repo Trading and Market Liquidity

	GSII**	Non-GSII	*Small banks*	*Medium banks*	*Large banks*	*Very large banks*
Total leverage exposure (bln Euro)	17850	14279	*309*	*3214*	*2395*	*26212*
Median LR	**4,3%**	**5,7%**	*6,9%*	*5,3%*	*4,8%*	*4,2%*
Median Tier 1 ratio	11,5%	13,4%	*15,2%*	*12,6%*	*11,3%*	*11,9%*
LR exposure class % of SFT's	**10%**	**4%**	*1%*	*2%*	*4%*	*8%*
Sample of institutions	14 (EU)	232	*92*	*97*	*19*	*38*
% of benchmark analysis	6%	94%	*37%*	*39%*	*8%*	*15%*

- **EBA Report shows No significant evidence on limiting SFT-transaction volumes**
- **Report shows that GSII's & Very Large Banks have relatively larger need for capital and having lower LR's**
- **Non-GSII's have fairly small exposure to LR - & balance sheet problems or additional capital needs**
- **Report shows also various correlations between LCR & LR & Capital Needs**

- Please see: **EBA Report on the Leverage Ratio Requirements under Article 511 of the CRR** chapter 3.4.2.ff pages 149following
- **please see updated list: http://www.fsb.org/wp-content/uploads/2016-list-of-global-systemically-important-banks-G-SIBs.pdf (GSII = Global Systematic important Institutions)

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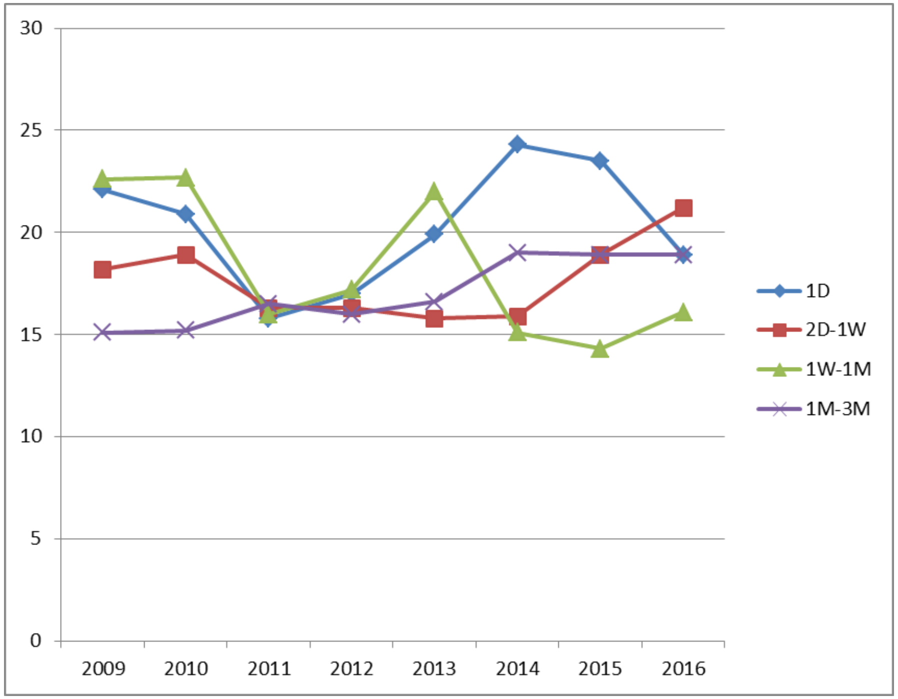
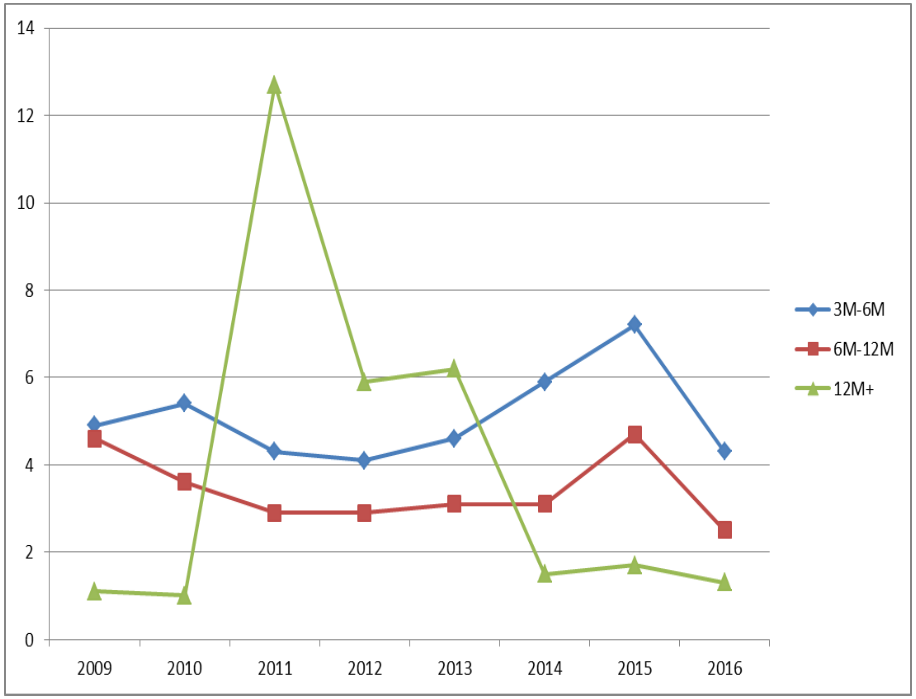
Leverage Ratio‘s Impact on Market Making Capacity, Repo Trading and Market Liquidity

Repo/Rev.Repo maturities 1D – 3Month



- December figures & volatility driven by EOY
- Combined percentage on short dated maturities trading between ON-3M is taking up about 70% (+/- 5&) market share of repo market

Repo/Rev.Repo maturities < 3Month – 12Month



- 2011 spike pre-government crisis period (2012)
- December figures & volatility driven by EOY and Q.4 balance sheet management
- General trend on trading shorter maturities

- * Data Source: ERCC Bi-Annual Repo Market Survey‘s 2009 - 2016

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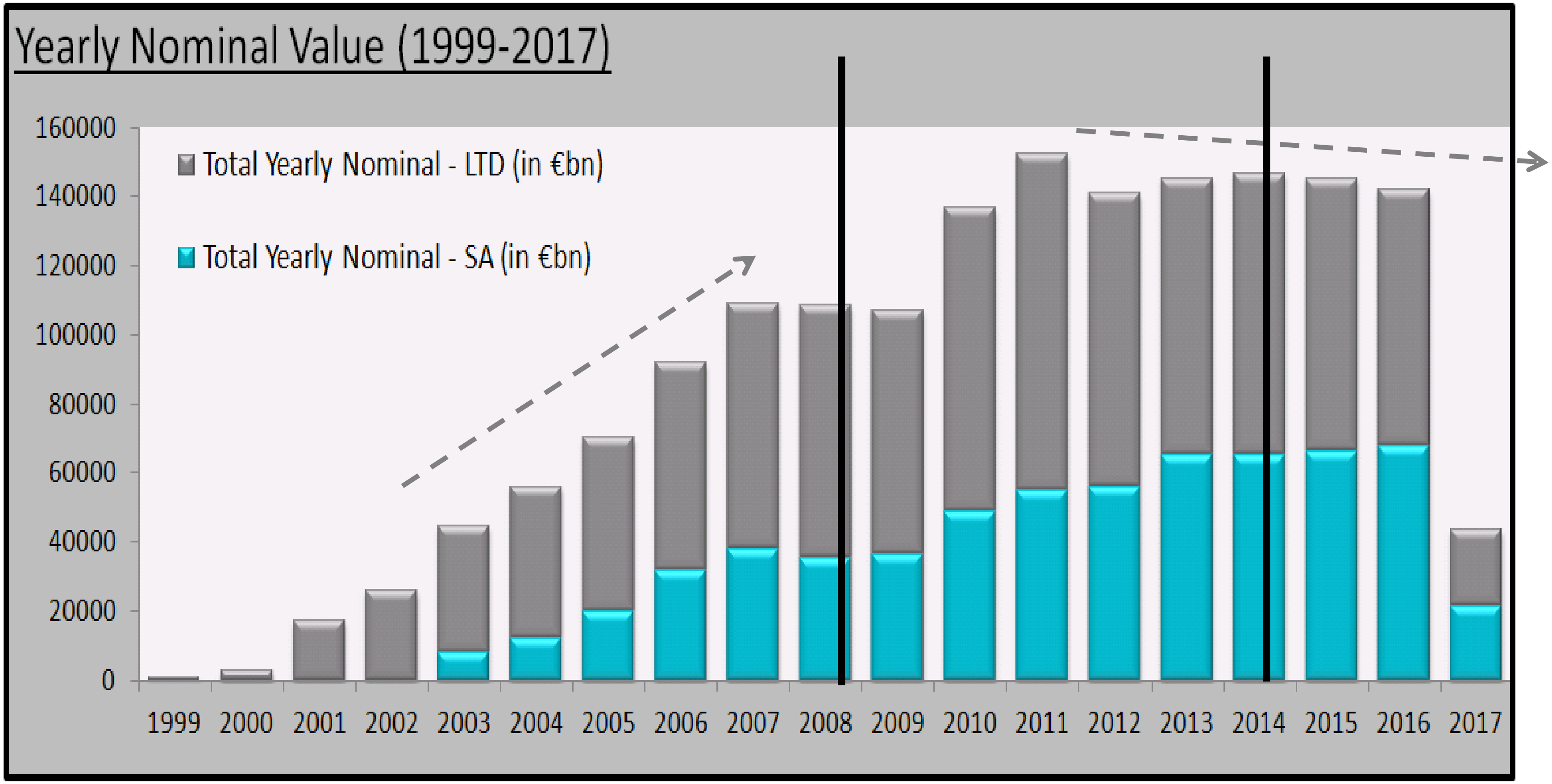
Leverage Ratio's* Impact on Market Making Capacity, Repo Trading and Market Liquidity



➢ **Example of : LCH S.A./Ltd.markets mainly driven by HQLA repo trading driven acitivies and shortage of counterparty limits**

- Source http://www.lch.com/asset-classes/repoclear/volumes

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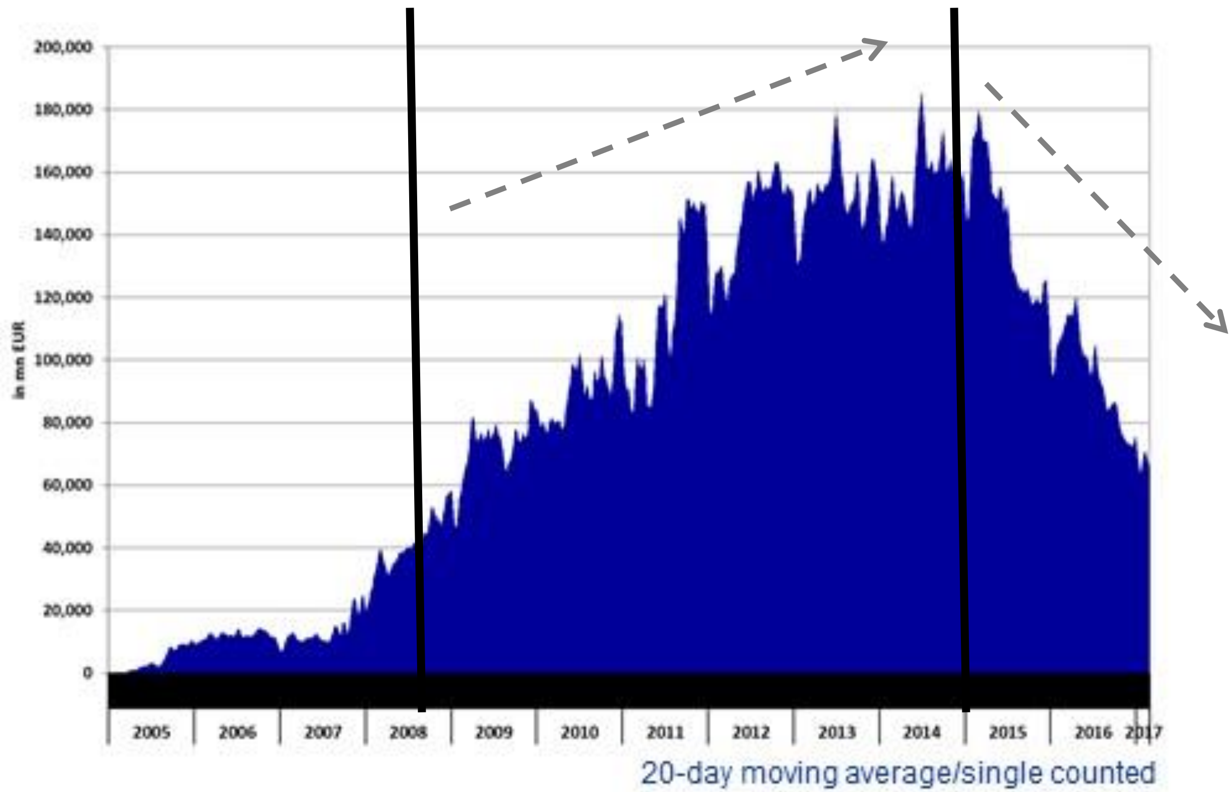
Leverage Ratio's* Impact on Market Making Capacity, Repo Trading and Market Liquidity



- ➢ **Example of Eurex Repo (GCPooling markets) mainly driven by treasury/liquidity vs.repo trading activities – volumes**
- ➢ **Indicate (neg.) correlation to expanded QE/Central Banks activities since 2014**

- Source http://www.eurexrepo.com/repo-en/info-center/statistics/Statistics/137846?frag=137778

Leverage Ratio‘s Impact on Market Making Capacity, Repo Trading and Market Liquidity

Advantages

Positive Effects on SFT Markets

1
- Complement to the Risk-Weighted Framework

2
- *Reduces build-up of excessive* balance sheet leverage potential

3
- *Easy to compare* due to no statistical variables

4
- Could help to *increase bank creditworthiness* as additional transparent ratio

5

Disadvantages

Negative Effects on SFT Markets

1
- Ratio has **no correlation** and **no sensitivity** to the **riskiness of assets**

2
- **Could cause shifts** into other sectors

3
- Does not (yet) take specific national market or sector issues into account

4
- Focus on & punishes repo as leverage tool

5
- Reduces balance sheet flexibility for repo trading capacity

- **Full impact on SFT – markets hard to measure due to larger picture of changing regulatory environment since 2010**
- **Impact on trading volumes, market depth and market activities influenced by Central Banks QE-activities and re-adjustments of business models**
- **ERCC Bi-Annual Repo Market Survey does not (yet) support evidence of decreasing market activities but shows further reductions in repo maturities and traded asset – classes in general.**

Your questions … ?

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Abbreviations

- AT 1 – Additional Tier 1
- AorL – Assets or Liabilities
- BCBS – Basel Committee on Banking Supervision
- CCR – Credit Conversion Factor
- CET1 – Common Equity Tier 1
- CRR – Capital Requirement Regulation
- EBA – European Banking Authority
- ECB – European Central Bank
- ESRB – European Systemic Risk Board
- G-SIB – Global Systemically Important Banks
- GSII – Globally Systematic Important Institutions
- LCH – London Clearing House Ltd./ London
- LCH – Clearnet S.A./ Paris
- LR – Leverage Ratio
- SA-CCR – Standardised Approach for measuring counterparty credit risk
- SFTs – Security Financing Transactions

- *https://www.esrb.europa.eu/home/html/index.en.html

Annex 4

Phase-in arrangements

(shading indicates transition periods - all dates are as of 1 January)

	2011	2012	2013	2014	2015	2016	2017	2018	As of 1 January 2019
Leverage Ratio	Supervisory monitoring		Parallel run 1 Jan 2013 – 1 Jan 2017 Disclosure starts 1 Jan 2015					Migration to Pillar 1	
Minimum Common Equity Capital Ratio			3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital Conservation Buffer						0.625%	1.25%	1.875%	2.50%
Minimum common equity plus capital conservation buffer			3.5%	4.0%	4.5%	5.125%	5.75%	6.375%	7.0%
Phase-in of deductions from CET1 (including amounts exceeding the limit for DTAs, MSRs and financials)				20%	40%	60%	80%	100%	100%
Minimum Tier 1 Capital			4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total Capital			8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum Total Capital plus conservation buffer			8.0%	8.0%	8.0%	8.625%	9.25%	9.875%	10.5%
Capital instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital			Phased out over 10 year horizon beginning 2013						

	2011	2012	2013	2014	2015	2016	2017	2018	As of 1 January 2019
Liquidity coverage ratio	Observation period begins				Introduce minimum standard				
Net stable funding ratio	Observation period begins							Introduce minimum standard	

- Source Annex 4 of BCBS Basel III: A global regulatoriy framework for more resilient banks and banking systems, December 2010 (rev June 2011)

Proposal for better reflecting drawdown rates and aligning CCFs under the current Standardised Approach and foundation IRB

(%) Table A

Off-balance sheet exposure types that receive CCF < 100%	Current SA	Foundation IRB	Proposal for revised SA
Commitments that are unconditionally cancellable at any time without prior notice, or that effectively provide automatic cancellation due to deterioration in borrower's creditworthiness; retail only	0%	0%	[10-20%]
Commitments, except retail unconditionally cancellable	-	75%	[50-75%]
Commitments with maturity ≤ 1 year, except retail unconditionally cancellable	20%	-	-
Commitments with maturity > 1 year, except retail unconditionally cancellable	50%	-	-
Note issuance facilities (NIFs) and revolving underwriting facilities (RUFs)	50%	75%	[50-75%]
Certain transaction-related contingent items	50%	50%	50%
Short-term self-liquidating trade letters of credit arising from the movement of goods	20%	20%	20%

Note: CCFs are found in paragraphs 82 to 89 for SA; and in paragraphs 311 to 315 for FIRB of current Basel II framework.

- Source BCBS Second consultative document, Standards, Revisions to the Standardised Approach of credit risk, December 2015

2016 list of global systemically important banks (G-SIB's) identified by the FSB, in consultation with BCBS and national authorities.

Annex

G-SIBs as of November 2016[9] allocated to buckets corresponding to required levels of additional capital buffers

Bucket[10]	G-SIBs in alphabetical order within each bucket
5 **(3.5%)**	(Empty)
4 **(2.5%)**	Citigroup JP Morgan Chase
3 **(2.0%)**	Bank of America BNP Paribas Deutsche Bank HSBC
2 **(1.5%)**	Barclays Credit Suisse Goldman Sachs Industrial and Commercial Bank of China Limited Mitsubishi UFJ FG Wells Fargo
1 **(1.0%)**	Agricultural Bank of China Bank of China Bank of New York Mellon China Construction Bank Groupe BPCE Groupe Crédit Agricole ING Bank Mizuho FG Morgan Stanley Nordea Royal Bank of Scotland Santander Société Générale Standard Chartered State Street Sumitomo Mitsui FG UBS Unicredit Group

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Vice President
Group Treasury
Head of of Money Market, Repo
and Collateral Trading

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LCR, NSFR and repo

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UBS

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Public

LCR & NSFR

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Global Head of Asset Sourcing and Optimization

2nd June 2017

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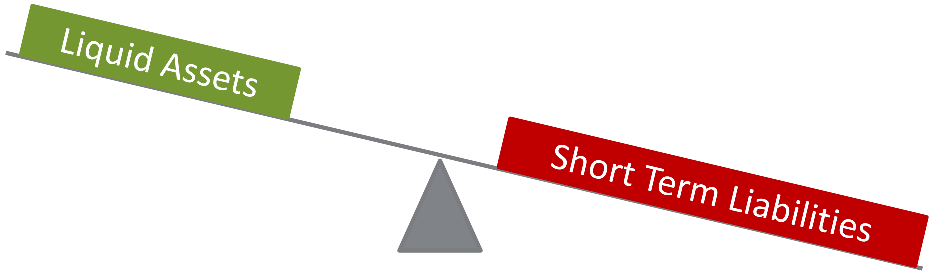
Section 1

Liquidity Coverage Ratio (LCR)

The Introduction of LCR

LCR is one of the many responses to the 2008 financial crisis.

- During the crisis many banks and buy-side firms ran into liquidity problems and essentially ran out of cash.



- Institutions were unable to meet short term funding requirements triggered by the shock to the financial system:
  - Failure to meet margin calls.
  - Insufficient funds to satisfy payments to creditors.
- The result was **firms went bust.**

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Liquidity Coverage Ratio overview

The purpose of the LCR is to provide banks with a measure of the amount of high quality liquid assets to be held against a 30 day stress period

Liquidity Coverage Ratio - Definition

Ensure that banks hold enough highly liquid assets to survive a short term (30 day) severe market and name specific stress

$$\frac{\text{Liquid Asset Buffer (HQLA)}}{\text{30 Day Net Cash Outflows}} > 100\%$$

Example Calculation

Cash Outflows	under 30-day stress scenario	-400bn
Cash Inflows		+200bn
Net Cash Outflows		-200bn
HQLA		+250bn

$$\text{LCR} = \frac{\text{250bn (HQLA)}}{\text{200bn (Net Cash Outflows)}} = \mathbf{125\%}$$

- The liquidity coverage ratio (LCR) provides banks with a measurement, helping them to define the level of liquidity buffer (HQLA) to be held to survive short-term (30-day) severe general market and firm-specific stresses.
- The requirement needs to be met continuously and must be regularly reported to the regulator. In case of a forecasted or actual breach in the LCR the regulator must be informed.
- The assets must be "under control" of Group Treasury in order to qualify as HQLA in the LCR calculation.
- Any increase in net outflows needs to be covered by additional HQLA in order to maintain the ratio. This subsequently leads to larger balance sheet consumption (1:1 LRD).
- To manage towards a stable LCR ratio, forecasting of business activities is becoming an important factor and the supply and quality of the data is important.
- Daily LCR is the new requirement.

High Quality Liquid Assets

HQLA is classified as Level 1, Level 2A and 2B assets depending on the asset category, quality and need to fulfil certain operational requirements

HQLA characteristics

Level 1 assets	HC
Cash & Central Bank Reserves Domestic sovereign or central bank debt for non 0% risk-weighted sovereigns Marketable securities assigned a 0% risk weight	0%

Level 2A assets (maximum 40% of HQLA pool)	HC
Marketable securities issued by sovereigns, central banks, Public Sector Entities (PSEs) and MDBs assigned a 20% risk weight Corporate debt securities rated AA- or higher Covered bonds rated AA- or higher	15%

Level 2B assets (maximum 15% of HQLA pool)	HC
RMBS (rated AA and higher), Corporate Debt (rated A+ to BBB-), Equity shares (major index)	25% (RMBS) 50%

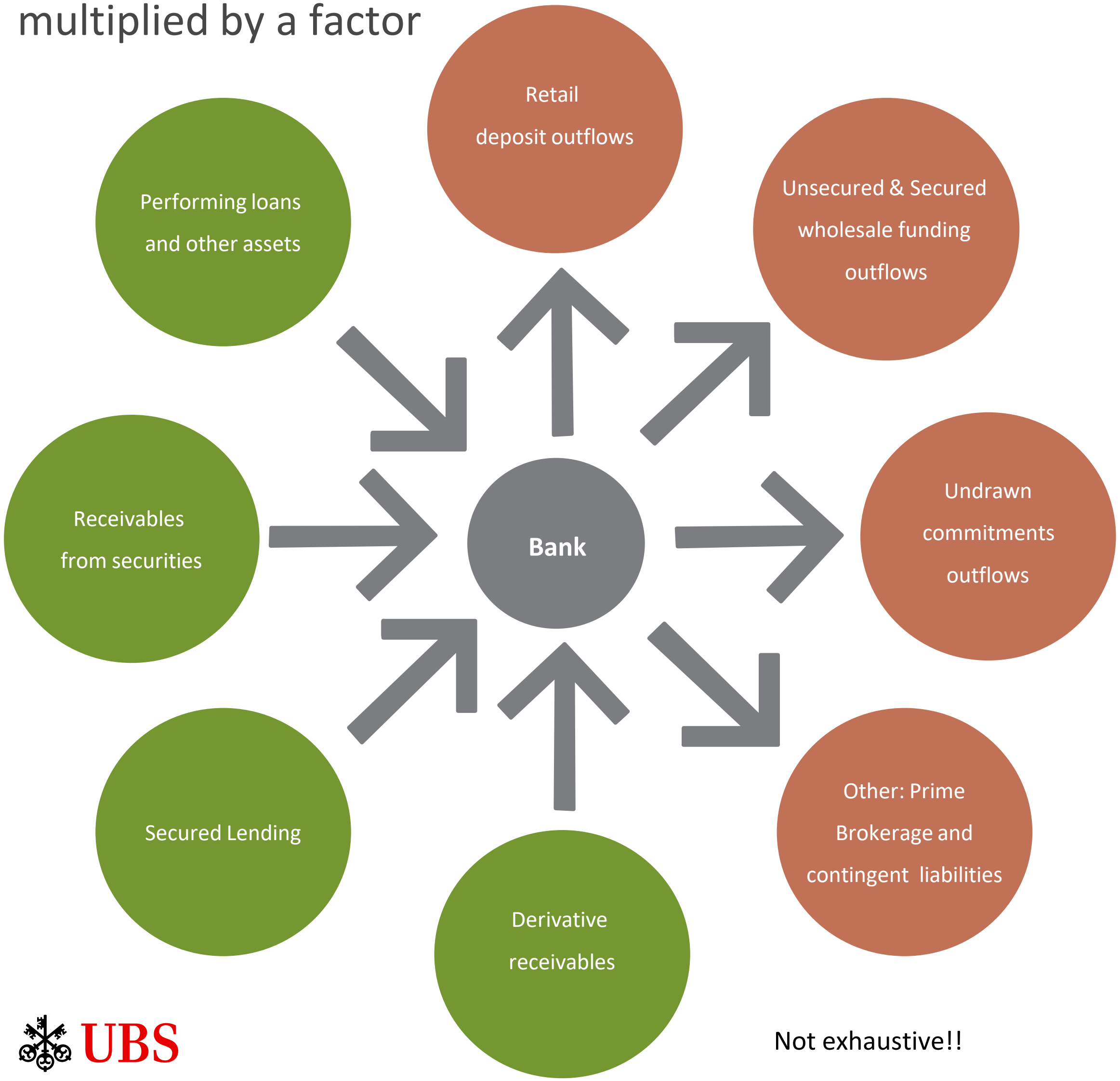
- Each level of asset is assigned a haircut (HC).
- Level 2A and Level 2B assets are subject to concentration limits of 40% and 15% respectively of the total HQLA pool, after determining the application of required haircuts.
- Level 2B assets can only be included at the discretion of the relevant national authority.
- There may be jurisdictional variation in the HQLA characteristics.

Operational requirements

Unencumbrance	Assets must be **unencumbered**, making them "free of legal, regulatory, contracted or other impediment"
Transfer capability	**No transfer restrictions** in the country where the asset is held and currency restrictions on the asset denomination
Treasury control	A liquidity management function, i.e. Treasury, must have **full control over HQLA holdings** with procedures and systems in place to enable "the immediate* monetization of assets when required". The location of HQLA in terms of legal entity, geographic location and custody account and asset diversification must be known and monitored.
Diversification	In relation to common equity shares, marketable securities, and corporate bonds, the stock of HQLA must be "appropriately diversified" with regard to asset type, issue, issuer type, and maturity.

Net Cash Outflows

Total expected cash outflows anticipate the net outflow of cash over the next 30 days multiplied by a factor



- Expected cash inflows are calculated by multiplying the contractual receivables by the factor at which the cash is expected to flow in during a stress period.
- Cash inflows are capped at 75% of cash outflows, requiring the firm to maintain a minimum stock of liquid assets of 25% cash outflows.
- This restriction ensures that the firm will hold a minimum level of HQLA at all times.
- The outflows estimate the worst-case scenario of a draw down on liquidity. **This is the size of the "run on the bank".**

Not exhaustive!!

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Section 2

Net Stable Funding Ratio (NSFR)

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Why Net Stable Funding Ratio?

The NSFR is designed to promote a stable funding profile of a bank's medium and long-term assets through stable sources of long-term liquidity.

- The Net Stable Funding Ratio was developed in the Basel III framework with the purpose of tackling the over-reliance by banks on short-term funding sources.

Timeline

Oct 2014	Apr 2016	22 Nov 2016	Q2/Q3 2017	Jan 2018
BCBS published final NSFR rules	FDIC, OCC, FRB NSFR proposal	Revised EU proposal expected	Final FINMA NSFR expected	NSFR expected to become binding??

- The NSFR essentially requires banks to hold **more stable and longer term funding sources** against their least liquid assets, thereby reducing maturity transformation risk- and reducing the need for emergency liquidity support from central banks in a crisis.
- Basel III defines the ratio as "the amount of available stable funding relative to the amount of required stable funding. This ratio should be equal to at least 100% on an on-going basis.

Net Stable Funding Ratio - Definition

$$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} \geq 100\%$$

- The calibration of the NSFR generally makes two assumptions:
  - With regard to tenor the NSFR generally assumes that longer-term liabilities are more stable than short-term liabilities.
  - With regard to funding types and counterparty the NSFR assumes that short-term (<1 year) deposits by retail customers and small business customers is behaviourally more stable than wholesale funding of the same maturity from other counterparties.

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Available Stable Funding

Available Stable Funding is the sum of the liabilities weighted by a stability factor according to their type

- The amounts of ASF are based on contractual maturity and the propensity of funding providers to withdraw funding in time of stress. Eligible stable funding can be grouped as five categories :
  - 1. Capital and secured / unsecured LT borrowings (>12m)
  - 2. Stable small business / retail demand deposits (<12m)
  - 3. Less Stable small business / retail demand deposits
  - 4. unsecured wholesale funding, non-maturity deposits
  - 5. All other liabilities and equity categories not included in the above
- ASF is calculated by assigning the carrying value of an institution's equity and liabilities to one of the categories and then multiplied by an ASF factor. The total available stable funding is the sum of the weighted amounts.

Components and weighting (FINMA draft rules)

	ASF Factor
Deposits from retail and small business customers	90-95%
Deposits from corporate customers	50%
Deposits from financial institutions	0%
Other secured /unsecured funding	
• <6m	0%
• 6m to ≥ 12m	50%
LT borrowing (≥ 12m)	100%
Trading/pension liabilities	0%
Regulatory Capital	100%

- NSFR is favourable for banking business:
  - high ASF factor assigned to stable deposits.
- Punitive for trading businesses:
  - limits overreliance on short-term wholesale funding, derivatives, Secured Financing Transactions / Repo and Prime Brokerage.

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Required Stable Funding

Required Stable Funding is measured based on broad characteristics of the liquidity risk profile of an institution's assets and off balance sheet exposures.

- RSF is the sum of
  - 1) the value of assets held and funded by the institution, multiplied by a specific RSF factor assigned to each particular asset type
  - 2) the amount of off balance sheet activity (or potential exposure) multiplied by its associated RSF factor
- The RSF factors assigned to various types of assets are intended to approximate the amount of a particular asset that would have to be funded, either because it will be rolled over, or because it could not be monetised through sale or used as collateral in a secured borrowing transaction over the course of one year without significant expense.

Components and weighting (FINMA draft rules)

	RSF Factor
Cash	0%
Loans and advances to banks	10-50%
Loans	50-85%
• Level 1 Securities	5%
• Level 2A securities	15-50%
• Level 2B securities	50%
• Non HQLA	85%
Net derivatives* • If receivables > payables	100%
• If receivables < payables	Floored at NRV*20%
Physical traded commodities (including gold)	85%
Other assets	100%
Off- balance sheet	5%

- Reverse Repo positions create an overall net RSF, regardless of the term structure.
  - Counterparty retains beneficial ownership of bond so for NSFR purposes this does not need to be funded.
  - Cash leg is considered a secured cash loan so must therefore be funded as an asset.
- Only Repos > 6mth would contribute towards ASF which creates an asymmetry in the secured financing trades space.

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NSFR – Effect on Repo

NSFR, may create additional stress and potentially force banks to hold billions of longer term funding in relation to positions taken in the Repo market.

- Repos generate ASF – dependent upon residual maturity and counterparty type.
- Reverse repos generate RSF - dependent upon residual maturity and counterparty type.
- There are certain amounts of asymmetry across Repos and Reverse Repos at the shorter (< 6 months) and longer (≥ 1 year) remaining residual maturities.

Residual maturities	< 6 months		≥ 6 months and < 1 year		≥ 1 year	
	Repo ASF	Reverse RSF	Repo ASF	Reverse RSF	Repo ASF	Reverse RSF
Sovereign/PSE	50%	50%	50%	50%	100%	65%/85%
Non-fin corp.	50%	50%	50%	50%	100%	65%/85%
Central Banks	0%	0%	50%	50%	100%	100%
Bank/financial	0%	10%/15%	50%	50%	100%	100%
Retail & small	0%	50%	50%	50%	100%	65%/85%

- This creates the need to manage gaps between the ASF and and RSF generated in Repo financing transactions.
- Clearly, banks will be required to hold longer-term "stable" funding against short term Reverse Repo assets – this will add to business costs.
- This will potentially create favoured counterparties and tenors of trade for executing Repos and Reverse Repos within the maturity buckets illustrated above.

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Mitigating NSFR Impacts

Counterparty and Tenor Selection

- < 6 months term:
  - Repos incentivised with Sovereigns PSEs and Non-Financial corporates (50% ASF).
  - Reverse Repos incentivised with Central Banks (0% RSF) or with banks and other financials (10% / 15% RSF)
- ≥ 6 months and <1 year term:
  - Repos incentivised with central banks, banks, other financials and retail & small business customers (50% ASF) over short term Repos (0% ASF).
  - Reverse Repos dis-incentivised with central banks or with banks and other financials (50% RSF) compared to shorter term Repos (0 – 15% RSF)
- ≥ 1 year:
  - Reverse Repos incentivised with Sovereigns, PSEs, non-financial corporates and retail & small business customers (all 65%/85% RSF) over central banks, banks and other financials (all 100% RSF).

- Some of the above may have unintended consequences
  - Some activities incentivised with Non-Financial corporates, retail and small business customers.

Availability of Netting

- Netting is one way to potentially mitigate the impact of NSFR by effectively achieving full elimination of RSF for the assets involved provided certain conditions are met:
  - Transactions have same explicit final settlement date.
  - Right to set off is legally enforceable (in normal course of business and in default / insolvency / bankruptcy)
  - Counterparties intend to settle net.

Section 3

Why does all this matter?

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Why does this matter?

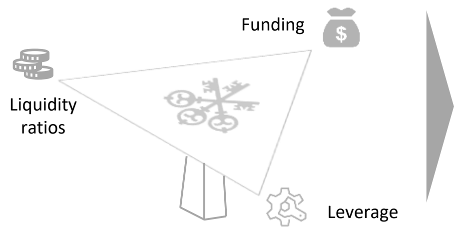
Optimising the firm's scarce financial resources is key

- The "Treasury Surface"

The Treasury Surface is the balance between Funding, Liquidity and Leverage ratios (LCR & NSFR). It is difficult to affect one of the 3 Key Levers without impacting one of the other two. All related metrics are fundamental to a healthy balance sheet. This needs to be constantly managed every **Day**, **Month**, **Quarter** and **Year**.

3 Key Levers that balance the surface		
Funding	**Liquidity Ratios**	**Leverage Ratio**

- Different types of trades will have varying effects on the metrics.
- All the metrics are linked together through Treasury Surface



Fundamental mission to create stability in the surface and maximise your return on capital.

- Why should banks not hold large excesses of HQLA or ASF?
- Economic drag
  - HQLA are generally low yielding – think cash and sovereign debt.
  - To fund the purchases of extra HQLA would require a bank to issue debt.
  - The cost of issuing debt to fund HQLA will outweigh the yield on the HQLA - higher hurdles for business.
- Leverage Ratio Drag
  - The purchase of additional HQLA would consume capital.
  - This capital would be tied up in HQLA rather than being put to use across the rest of the bank.
- A scenario where there is less capital available across a bank, with higher hurdle costs would put significant stress on revenue generating functions.

Examples

Suppose a firm is short LCR, long funding and flat leverage – what options are available?

Option 1

Suppose the firm issues 6-month Commercial Paper

Increase in HQLA (cash generated from CP issuance)

30 Day Net Cash Outflows remain unchanged

$$\text{LCR} = \frac{\text{Liquid Asset Buffer (HQLA)}}{\text{30 Day Net Cash Outflows}}$$

LCR Increases

BUT Funding moves longer and Leverage increase

Option 2

Suppose the firm enters into collateral upgrade (Non-HQLA for HQLA)

Increase in HQLA (HQLA received under upgrade)

30 Day Net Cash Outflows remain unchanged

$$\text{LCR} = \frac{\text{Liquid Asset Buffer (HQLA)}}{\text{30 Day Net Cash Outflows}}$$

LCR Increases

Funding and Leverage neutral

Conclusion

Option 2 is most optimal for scarce resources...

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SFTR, MiFID, CSDR

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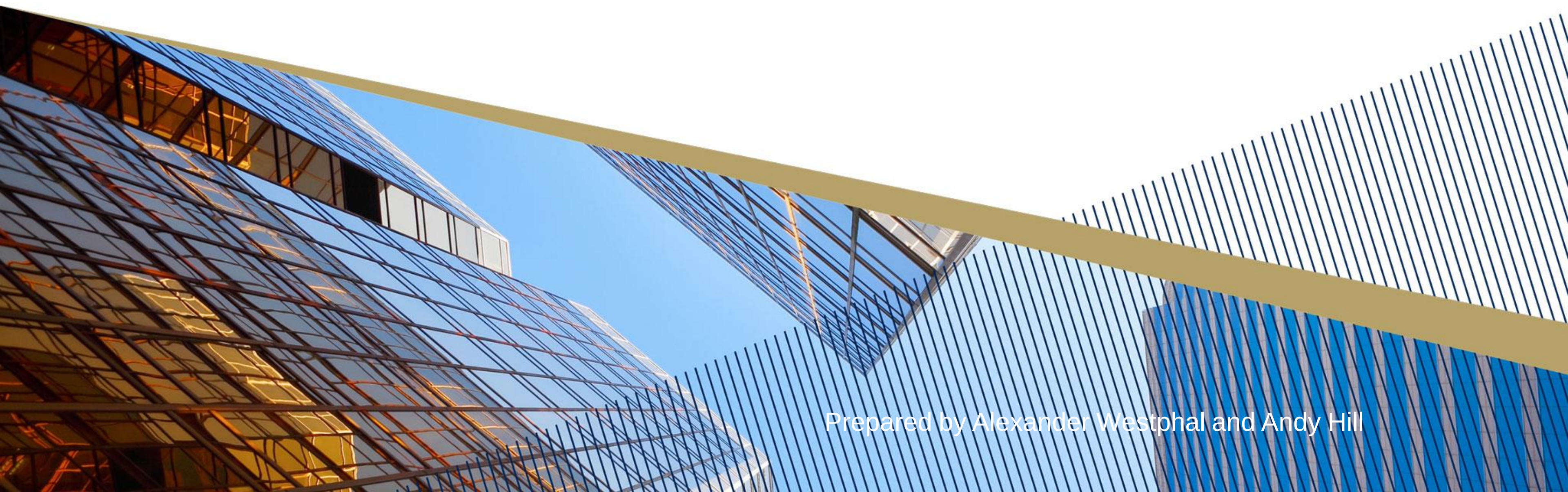
Repo and collateral management:
SFTR, MIFID, CSDR

ICMA Workshop: Professional Repo and Collateral Management Agenda
London, June 2 2017



Prepared by Alexander Westphal and Andy Hill

Overview

- ❑ SFT-Regulation
- ❑ MiFID II/R and repo
- ❑ CSDR Settlement Discipline

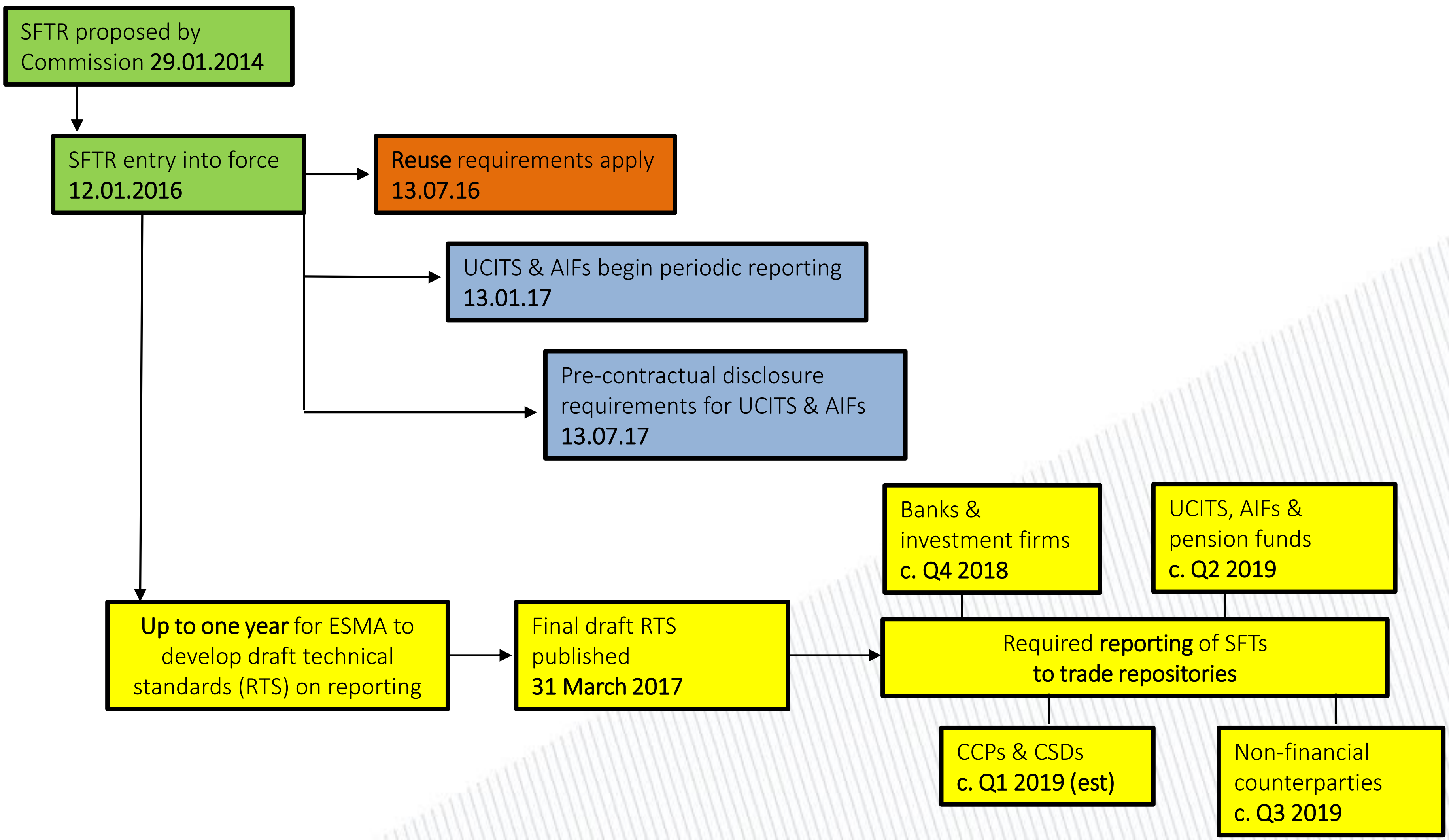
SFT markets in the regulatory focus

- Regulators increasingly focused on SFT markets as part of the global "shadow banking" agenda
  - *FSB Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos* (Aug 2013)
  - European Commission *Communication on Shadow Banking* (Sep 2013)

- Improving transparency in SFT markets identified as one of the key objectives and an urgent priority

- EU SFT Regulation (SFTR) proposed in Jan 2014 to introduce comprehensive reporting regime for SFTs in Europe
  - SFTs defined to mean: repo / reverse repo; securities or commodities lending / borrowing; buy-sell back / sell-buy back; margin lending

SFTR: Key elements and timeline



SFTR: reuse requirements (art. 15)

- SFTR defines "reuse" to mean:
  - *The use (other than by way of liquidation in the event of default) by a receiving counterparty, in its own name and on its own account or on the account of another counterparty, including any natural person, of **financial instruments received under a collateral arrangement***
- Any **right of counterparties to reuse** financial instruments received as collateral is subject to the following conditions:
  - **Title transfer (TTCA):** Providing party has (1) expressly agreed to provide collateral by way of a TTCA; and (2) has been **duly informed in writing** of possible risks and consequences from concluding a TTCA – see joint industry information statement
  - **Pledge (SCA):** Providing counterparty (1) has granted **prior express consent** (in writing or legally equivalent) to the right to reuse; and (2) has been **duly informed in writing** of possible risks and consequences from granting consent to a right of use of collateral provided under a SCA
- Any **exercise by counterparties of their right to reuse** is subject to the following conditions:
  - Reuse is undertaken in accordance with the terms of the collateral arrangement;
  - The financial instruments received under a collateral arrangement are transferred from the account of the providing counterparty

SFTR: reporting (art. 4) – Level 1

- **Key provisions:**
  - Counterparties to **report the details of all SFTs concluded**, as well as any modification or termination thereof to a trade repository specifically authorized under SFTR
  - Reporting **no later than on the working day following the conclusion**, modification or termination of the transaction (T+1)
  - SFTR sets out **list of minimum reporting elements**, including in relation to the reuse of collateral (where distinguishable from other assets)
  - Requirements apply to **EU counterparties** (incl. all (non-EU) branches) & **EU branches of third country firms**; except certain public bodies (Central Banks, DMOs, BIS)
  - SFTs with EU Central Banks are exempt from reporting
  - The reporting obligation **may be delegated** to a third party ("mandatory delegation" in case of SME non-financials)
  - Some general SFT record-keeping requirements already in force (art. 4.4)
- **ESMA to prepare draft RTS and ITS to specify content, format & frequency of SFT reports to TRs – including LEIs, ISINs & UTIs**

SFTR: reporting (Art. 4) – ESMA final draft RTS/ITS (31 March 2017)

- **Key proposals:**
  - Standard reporting format based on **ISO20022**
  - Broadly aligned with **EMIR reporting** regime for derivatives (e.g. action types)
  - **Over 80 proposed reporting fields** for repo alone (c'party, loan, collateral data)
  - Intra- and inter-TR **reconciliation** required on the majority of fields with very limited tolerance
  - Reporting of **collateral information** by value date + 1 at the latest
  - Daily **collateral updates** with daily revaluations
  - **Margining** to be reported on an end-of-day basis (CCP & bilateral)
  - **Collateral re-use** to be reported at ISIN level ("approximate measure" where assets are not distinguishable)
- **ESMA final draft RTS/ITS currently reviewed by Commission – final adoption expected by end 2017**

SFTR reporting – challenges

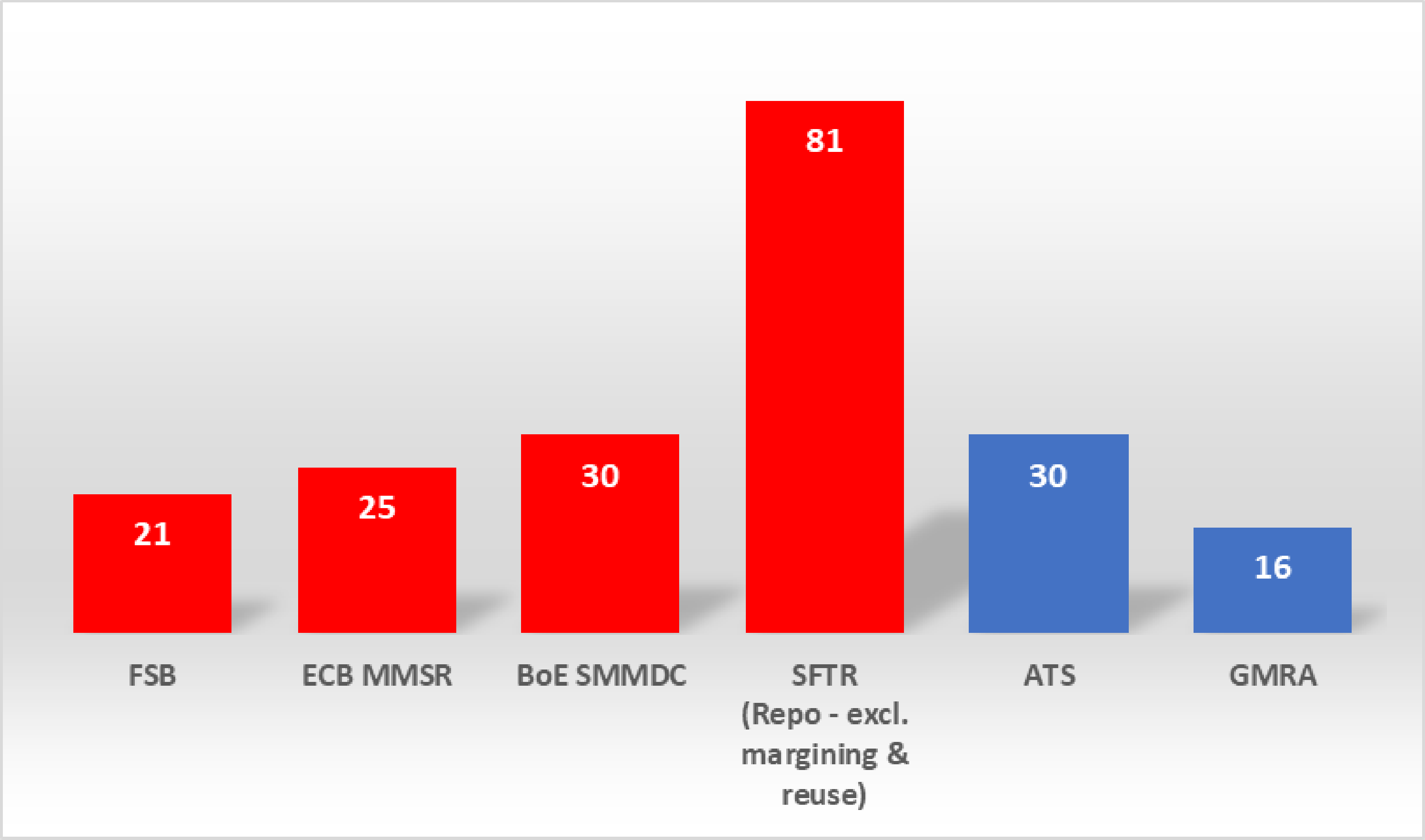
- **SFTR will change the way SFTs are processed today…**
  - Focus today on matching trade economics, settlement finality and efficient margining processes – SFTR introduces unprecedented level of scrutiny on repo trade lifecycle
  - Likely to lead in the longer terms to much higher levels of automation and electronic trading
- **Reconciliation expected to be the key challenge**
  - Intra- and inter-TR reconciliation required on 61 fields for repo (43 for BSBs)
  - Gradual implementation in two stages: initially 47 fields for repo (38 for BSBs)
  - Third party vendor solutions expected to play an important role in facilitating implementation
- **Significant additional challenges for other types of SFTs, particularly securities lending**

Other reporting of SFTs

- **Money market reporting**
  - **Euro area:** ECB Money Market Statistical Reporting Regulation (MMSR) – daily reporting by 53 largest firms started in June 2016
  - **UK:** Bank of England: Sterling money market data collection – daily reporting started in July 2016
- **FSB initiative on global SFT data collection and aggregation**
  - Final standards and processes for Global SFT data collection (Nov 2015)
  - Possible Measures of Non-Cash Collateral Re-Use, including proposals for the tracking of reuse (final version Jan 2017)
  - Global data aggregation to start by end 2018 (re-use related data by Jan 2020)
- **MiFID II/R transaction reporting (art. 26)**
  - SFTs generally exempt from transaction reporting under MiFIR, **except SFTs with EU central banks** (exempted from SFTR reporting)
  - These will have to be reported based on MiFIR reporting templates set out in RTS 22
  - Implementation timeline aligned with SFTR reporting

SFTR reporting vs other initiatives vs current market practice

Number of reporting fields required



MiFID II/R

What is MIFID II and MIFIR?

- The Markets in Financial Instruments Directive (MiFID) is an EU law that provides harmonized regulation for investment services across the 31 member states of the European Economic Area. The directive's main objectives are to increase competition and consumer protection in investment services. MiFID became effective in November 2007, and is primarily related to equities markets.

- MiFID II (along with the Markets in Financial Instruments Regulation – MiFIR), replaces MiFID, and broadens its scope to non-equities, including bonds. Among the key aspects of MiFID II/R are provisions covering: transaction reporting, market structure, pre-trade transparency requirements, post-trade reporting, best execution reporting, and conduct of business rules.

- MiFID II/R entered into force in July 2014. The ‘Level 2’ regulatory and implementing technical standards were submitted to the European Commission by ESMA in September 2015. Following approval by the Commission, Council, and Parliament, it is scheduled to be implemented in January 2018.

MiFID II/R

What are the pertinent elements of MIFID II/R for repo?

- The key aspects of the regulation that impact repo markets are **best execution reporting obligations**, **transacting with retail clients** and, to a limited extent, **transaction reporting**.

- There are no pre- or post-trade reporting (transparency) obligations with respect to securities financing transactions (SFTs).

MiFID II/R

Does MiFID II/R allow the transacting of repos with retail clients?

- Article 16(10) of MiFID II specifies that "an investment firm shall not conclude title transfer collateral arrangements for the purpose of securing or covering present or future, actual or contingent or prospective obligations of clients". This would seem to suggest that transacting repos and other SFTs (which facilitate title transfer) would no longer be permitted with "retail clients".

- MiFID II defines a "retail client" as a client who is not a professional client or an eligible counterparty. While most retail clients are unlikely to engage in repo transactions, counterparties excluded from the definition of professional client or eligible counterparty include **local authorities** and **municipalities**, who may. Such counterparties would accordingly need to elect to change their status to "professional" in order to continue transacting repo and other title transfer arrangements.

MiFID II/R

Are there any MiFID II/R transaction reporting requirements for repo?

- MiFID II/R makes a distinction between trade reporting and **transaction reporting**. Trade reporting relates to the pre- and post-trade transparency obligations of trading venues (including systematic internalisers) to make public certain trading interests and transaction details. **Transaction reporting** entails more extensive reporting of trade details (including counterparties) by investment firms to the relevant regulatory bodies (the national competent authorities –NCAs). Transaction reports are primarily used by regulatory authorities to detect market abuse and the data is not made available to other market participants. The reporting requirements are set out in RTS 22.

- Importantly, **RTS 22, as currently proposed, provides a specific exclusion for transaction reporting for SFTs where these are already in scope of the transaction reporting requirements of EMIR and SFTR**:

  "A transaction for the purposes of Article 26 of Regulation (EU) No 600/2014 [MiFIR] shall not include the following:

  (a) securities financing transactions as defined in Article 3(11) of Regulation (EU) 2015/2365 [SFTR] of the European Parliament and of the Council;"

MiFID II/R

Are there any MiFID II/R transaction reporting requirements for repo?

- However, the notable exception to this exemption is with respect to **SFTs transacted with central banks in the ESCB** (European System of Central Banks), and these **are in scope of the transaction reporting requirements** of MiFID II/R [Article 2(5)].

- It should be noted, however, that while the reporting requirements under RTS 22 shall apply from 3 January 2018, Article 17 stipulates that the reporting requirement for SFTs with ESCB counterparties (Article 2(5)), does not apply until "12 months after the date of entry into force of the delegated act adopted by the Commission pursuant to Article 4(9) of Regulation (EU) 2015/2365". In other words, transaction reporting for SFTs with ESCB counterparties comes into force at the same time as SFTR reporting requirements.

MiFID II/R

What are the MiFID II/R best execution reporting obligations for repo?

- RTS 28 specifies reporting requirements for investment firms executing client orders related to the details and quality of execution for each class of financial instrument on their top five execution venues (including systematic internalisers, market makers, and other liquidity providers) in terms of trading volumes. Data includes the identity of the trading venues, volume and number of transactions (disaggregated by types of order), as well as a summary of analysis and conclusions drawn by the investment firm from their "detailed monitoring of the quality of execution obtained on all client orders".

- Investment firms are required to report information on an annual basis, using specified templates. **Data related to SFT client orders are required to be reported separately** from client order flow in non-SFTs.

MiFID II/R

RTS 28 reporting template for SFTs

Table 3

Class of Instrument		
Notification if <1 average trade per business day in the previous year	**Yes / No**	
Top 5 Venues ranked in terms of volume (descending order)	Proportion of volume executed as a percentage of total in that class	Proportion of orders executed as percentage of total in that class
Name and Venue Identifier(MIC or LEI)		
Name and Venue identifier(MIC or LEI)		
Name and venue identifier(MIC or LEI)		
Name and venue identifier(MIC or LEI)		
Name and venue identifier(MIC or LEI)		

MiFID II/R

What are the MiFID II/R best execution reporting obligations for repo?

- While RTS 28 is also intended to apply to certain SFTs, it remains unclear as to whether RTS 27 is also intended to apply to SFTs.

- RTS 27 specifies onerous and detailed reporting requirements for trading venues, systematic internalisers (SIs), market makers, and other liquidity providers, to make publicly available, at no charge, data relating to the quality of execution of transactions on that venue (or with that liquidity provider). Details to be made available include price data (intraday and daily), costs related to execution, likelihood of execution, as well as additional information related to the type of venue.

- Best execution data are required to be published quarterly, no later than three months at the end of each quarter, using specified reporting templates, and should be made publicly available in machine-readable form.

MiFID II/R

What are the MiFID II/R best execution reporting obligations for repo?

- While there is no specific mention of SFTs in RTS 27, and the reporting templates and requirements are not obviously suited to SFTs, there is nothing in the text that explicitly exempts SFTs. ICMA and others have requested clarification on (i) whether SFTs are intended to be in scope of RTS 27, and in the event that they are, (ii) detailed guidance on how to report them in a meaningful and consistent way.

- In February 2017, ICMA published a discussion paper highlighting the challenges and (im)practicalities of trying to report SFT data under MiFID II/R best execution requirements.

- However, as of June 2017, no clarification has yet been provided. Meanwhile, firms will be expected to comply (maybe) from January 2018.

MiFID II/R

Are repos (and other SFTs) in scope of MiFID II/R pre- and post-trade transparency obligations?

- On June 30 2016, an agreed amendment to MiFIR was published in the Official Journal of the EU that included an exemption for SFTs under Article 1 relating to pre- and post-trade transparency obligations:

"Regulation (EU) No 600/2014 [MiFIR] is amended as follows: (1) in Article 1, the following paragraph is inserted: 5a. Title II and Title III of this Regulation shall not apply to securities financing transactions as defined in point (11) of Article 3 of Regulation (EU) 2015/2365 of the European Parliament and of the Council [SFTR]".

- **In other words, SFTs, including repo, are not subject to pre- or post-trade reporting requirements.**

CSDR: Settlement Discipline

What is CSDR?

- The regulation on central securities depositories and securities settlement (otherwise known as CSDR) is intended to enhance the safety and soundness of the European financial markets by providing a framework in which systemically important securities infrastructures are subject to common rules. This will cover all trading venues, central counterparties, trade repositories, and central securities depositories (CSDs) within the European Union.

- The CSDR covers three main areas:
  - It sets out an EU-wide regulatory and prudential regime for the authorization of central securities depositories, as well as outlining the various operational, business, and legal requirements for the provision of services by CSDs.
  - It aims to harmonize member states' national securities settlement rules to support and encourage cross border securities settlement, **including the provision of rules for the length of time required for settling securities and the application of penalties for the failure of securities settlement transactions**.
  - It looks to establish access arrangements between central securities depositories and other financial market infrastructure so that they can obtain access to each other's services, with the intention of supporting a competitive single market in post trade financial services, which would reduce costs and improve services.

CSDR: Settlement Discipline

What is CSDR Settlement Discipline?

- Level 1 of CSDR (which became law in 2014) provides for *measures to prevent and address settlement fails,* otherwise known as Settlement Discipline

- There are 3 main components of Settlement Discipline:
  - CSDs to establish systems to monitor fails. This includes publishing the names of the ten participants with the highest fails rates
  - CSDs to provide a penalty/compensation mechanism which will serve as a deterrent for settlement fails
  - **A mandatory buy-in to be initiated where a transaction is still failing 4 days after intended settlement date (ISD) – this has scope to be increased to 7 days, depending on liquidity of the security being bought in**

CSDR: Settlement Discipline

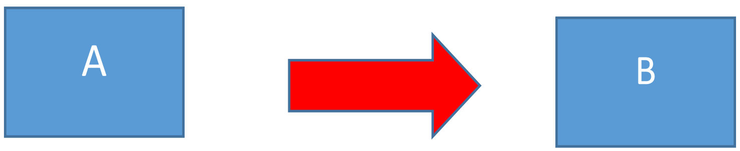
What is a buy-in?

- A buy-in is a remedy available to the purchaser of a security in the event that the seller of the securities fails to make good delivery on intended settlement date.
- The failed-to purchaser (the 'disappointed counterparty') has the right to purchase the failing securities from another counterparty (normally executed by an appointed principal intermediary, known as the 'buy-in agent'), for guaranteed delivery, to replace the original failing purchase.
- Any differential in price between the original failing purchase and the buy-in is settled between the two counterparties. This ensures that both counterparties, from an economic perspective, are in the same position they would have been had the original trade settled as intended.
- In practice, the failing counterparty will often be disadvantaged since the buy-in will leave them with a long position that they will need either to sell or mark-to-market, at a market price that will, in most instances, be below the buy-in price.
- The less liquid the bond, the greater the buy-in price/market price differential is likely to be.
- Transactions under ICMA rules provide for a buy-in remedy.

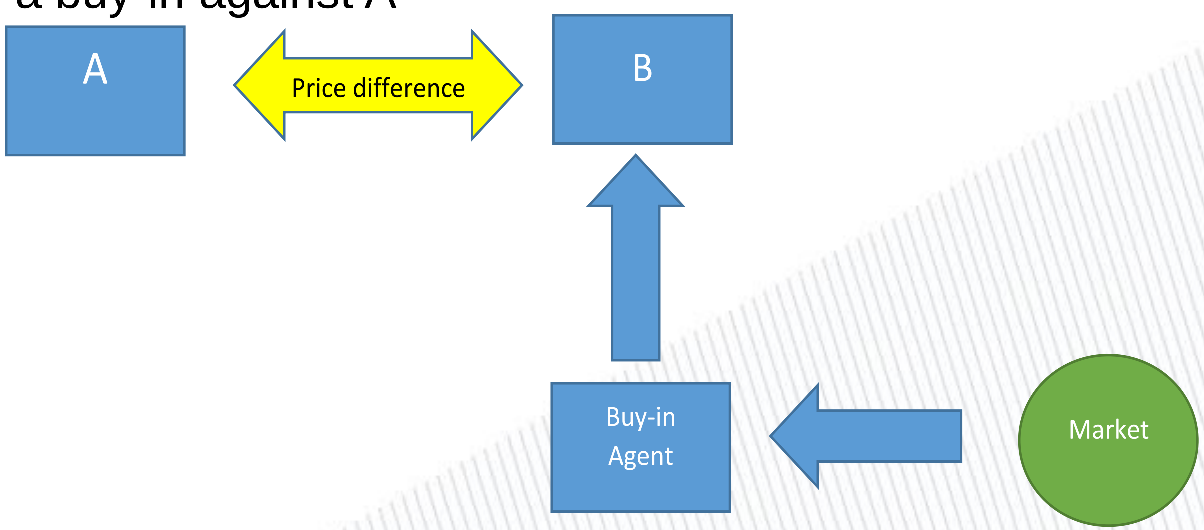
CSDR: Settlement Discipline

What is a buy-in?

A’s sale to B fails



B issues a buy-in against A



* Following an amendment to the ICMA buy-in rules in March 2017, it is no longer necessary for the initiator of the buy-in to appoint a buy-in agent

CSDR: Settlement Discipline

What is a CSDR buy-in?

- ❑ A buy-in is no longer a discretionary remedy available to a failed-to purchaser in order to manage their settlement risk; it is a mandatory obligation enforced by law.
- ❑ The Level 1 regulation places the obligation of executing the buy-in, not only on the failed-to purchaser against the failing seller, but on the failed-to purchaser's settlement agent or custodian, its CSD, or the trading venue it executed the trade on, against the failing sellers settlement agent, custodian, or CSD.
- ❑ The Level 1 regulation does not provide for a symmetrical payment of the buy-in price differential between parties: meaning that in the case where the buy-in price is lower than the original trade price, the failed-to purchaser will make an additional unexpected profit, at the expense of the failing seller (known as the 'CSDR put').
- ❑ In the event that the buy-in is unsuccessful, this will result in the original trade being canceled with cash compensation being paid to the failed-to buyer by the failing seller (only in the event that the reference price determined for cash compensation is higher than the trade price).
- ❑ The Level 1 intended to apply mandatory buy-ins to SFTs.

CSDR: Settlement Discipline

Improvements in the draft Level 2…

- Following two consultation processes, and intense market advocacy, the draft RTS for the mandatory buy-in mechanism were published in February 2016.

- The notable improvements were:
  - Buy-ins to take place at the trading level (not directly involving CSD participants, CSDs, or trading venues).
  - The maximum possible 'extension period' of 7 days for all fixed income instruments.
  - An exemption for SFTs with maturities up to 30 business days.

CSDR: Settlement Discipline

Unresolved issues with CSDR mandatory buy-ins

- ❑The mandatory nature of the buy-in process (including cash compensation)
- ❑The inability to pass-on risks and costs against a failing SFT (disincentive to lend)
- ❑The inability to pass-on the buy-in against a CCP
- ❑The inflexibility of the timing for initiating the buy-in (creates multiple buy-ins)
- ❑The asymmetry of the payment for the buy-in or cash compensation differential (the CSDR put)

CSDR: Settlement Discipline

When will CSDR mandatory buy-ins be implemented?

- The other components of CSDR-SD (including cash penalties) have been published in the official journal and will be implemented 24 months after the whole SD package (i.e. mandatory buy-ins) has been published in the OJ.

- As of June 2017, the draft RTS for mandatory buy-ins has yet to be approved by the co-legislators.

- ICMA and others continue to argue against the implementation of CSDR mandatory buy-ins on the grounds that it is fundamentally flawed and will be detrimental to bond market stability and liquidity.

Resources

SFTR

ICMA response to ESMA Consultation Paper on SFTR, November 2016

SFT identification and reporting: Regulatory overview paper and impact analysis, August 2016

MiFID

MiFID II/R and Repo Q&A: Updated, April 2017

Discussion paper on MiFID II Best Execution requirements for repo and SFTs: The challenges and (im)practicalities, January 2017

CSDR

CSDR Settlement Discipline: An ICMA Position Paper, May 2017

CSD Mandatory Buy-ins: An illustration of the problems arising from the asymmetric treatment of the payment of the buy-in or cash compensation differential, February 2016

CSDR Mandatory Buy-ins Final Regulatory Technical Standards: an overview, February 2016

ICMA Impact Study for CSDR Mandatory Buy-ins, February 2015

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Lunch

CCPs: what they can and cannot do & Client-clearing: the LCH sponsorship model

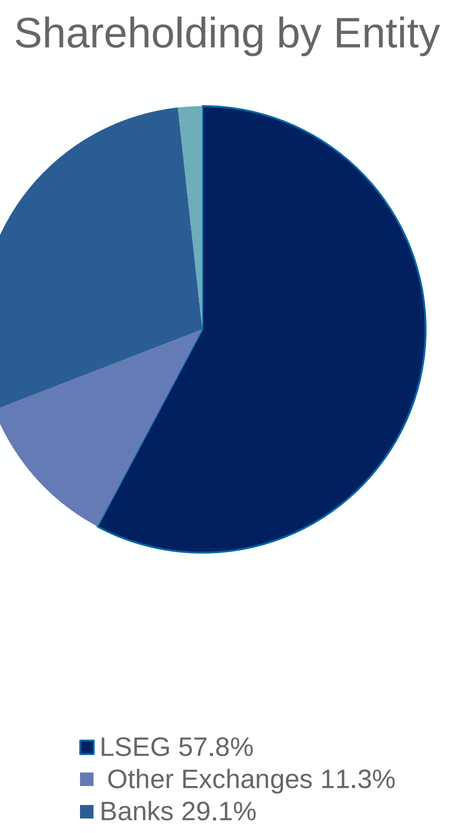
Nigel Bradley, Deputy Head of Product Development for RepoClear, EquityClear and Collateral, LCH

RepoClear

A Central Counterparty for Repo

LCH - Background

- Private company with a public mission
- To be the most trusted clearing house in the markets we serve
- Deep interaction and cooperation with regulators around the world. One of very few CCPs to have a global regulatory college to provide transparency
- Serves major exchanges and platforms in all times zones as well as a range of OTC markets
- Provides the markets with exceptional levels of protection through its world-class risk management framework
- Proven record of successfully managed defaults
- Owned 57.8% by the London Stock Exchange Group and 42.2% by users and other exchanges (Nasdaq, Euronext)
- Operating a fully open and horizontal access model
- The world's leading independent CCP group, with CCPs in London, Paris and United States



LCH: Corporate Overview

The LCH Group

LCH is a leading multi-asset class clearing house, serving a broad number of major exchanges and platforms as well as a range of OTC markets. LCH's commitment to the horizontal model supports clearing across multiple markets, exchanges, venues and geographies.

Corporate and Regulatory Structure

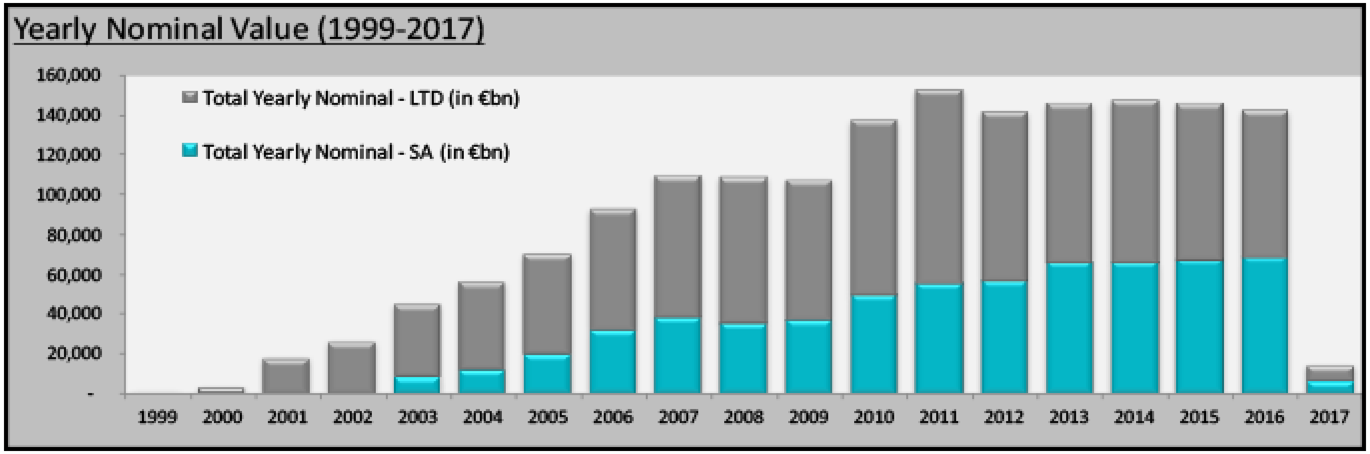
Holding Company	LCH Group Limited (Incorporated in UK/regulated by Autorité de contrôle prudentiel et de résolution (ACPR), France)		
Operating Entities	LCH Ltd Location: London Incorporated in UK	LCH SA Location: Paris Incorporated in France	LCH LLC Location: New York Organized in Delaware
Primary Regulator	Bank of England	L'Authorité des marchés financiers (AMF), L'Autorité de contrôle prudentiel et de résolution (ACPR), and Banque de France.	Commodity Futures Trading Commission (CFTC), USA.

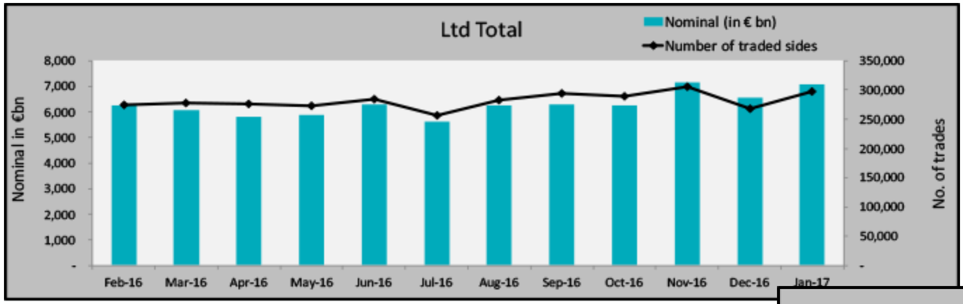
RepoClear Service

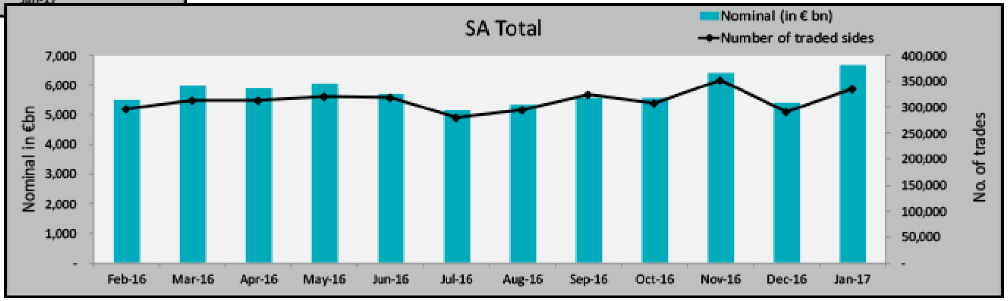
RepoClear is a market leading service clearing cash bond and repo trades across a number of European markets. Operating since 1999, it provides an essential, centralized clearing and netting facility for its members.

The RepoClear Service

RepoClear Cleared Volume







Source: http://www.lch.com/asset-classes/repoclear/volumes

RepoClear Services & Products

RepoClear	
LCH Ltd	LCH SA
11 European government bond markets cleared • Austria, Belgium, Netherlands, German, Ireland, Finland, Portugal, Slovakia, Slovenia, Spain & UK • General Collateral products in Term £GC and €GC In addition: • € and $ Supranationals, Agencies and Sovereigns • German Jumbo Pfandbriefe	4 European government bond markets cleared • France, Italy, Germany and Spain • Interoperable link for Italian government bond market segment between LCH SA and CC&G €GCPlus • General Collateral clearing service of Euro cash liquidity supported by two standardised baskets based on ECB eligible securities

Key features:

- Anonymous trading via electronic platforms or bilaterally via voice broker or inter-office
- Clearing of eligible cash bond and repo transactions
- Multi-lateral netting of all settlement obligations

Industry Changes

Risk	Regulatory sentiment has moved towards favouring clearing as a means of risk mitigation. In addition wider measures such as the introduction of minimum mandated haircuts are in focus
Regulatory Change	Compliance with Leverage Ratio (LR), Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR)
Effect	Creating challenges for the repo market, influencing the amount of available balance sheet and capital **Leverage Ratio**: more Tier 1 capital required against total on- and off-balance sheet exposures **Liquidity Coverage Ratio** : requires more High Quality Liquid Assets (HQLA) to be held that can be sold or repo'd for cash to meet expected outflows during a 30-day market crisis **Net Stable Funding Ratio**: banks should maintain enough 'stable' funding to cover different types of lending Consequently; • Balance sheet becoming a scarce resource, causing market participants to have to reduce the balance sheet resources utilised to support repo activity • Banks and intermediaries increasing their holdings of HQLA that will in turn need to be 'churned' frequently to demonstrate liquidity

LCH: Part of the Solution

To introduce an enhanced risk management framework that improves market efficiencies and reduces the resources required to support Repo trading

Regulation is making repo more expensive

Maximising netting opportunities through CCP will optimise balance sheet netting opportunities and maintain capacity

LCH Ltd and LCH SA already provides cleared access to the major liquidity providers

The RepoClear Service

Connected	Efficient	Liquid	Robust
• One-to-all access model • Single Clearing Member Agreement – no need for multiple GMRAs • Reduced time to market	• Balance sheet and capital efficiencies – balance sheet constraints of dealers financing via multilateral netting • Access to the LCH eco-system of risk management tools and capabilities	• Deep and established pool of liquidity • Major liquidity providers already members • Served by leading electronic execution platforms	• Strong and proven risk management – particularly in times of stress • Default Funds and margins protect non-defaulting members

Balance Sheet Netting

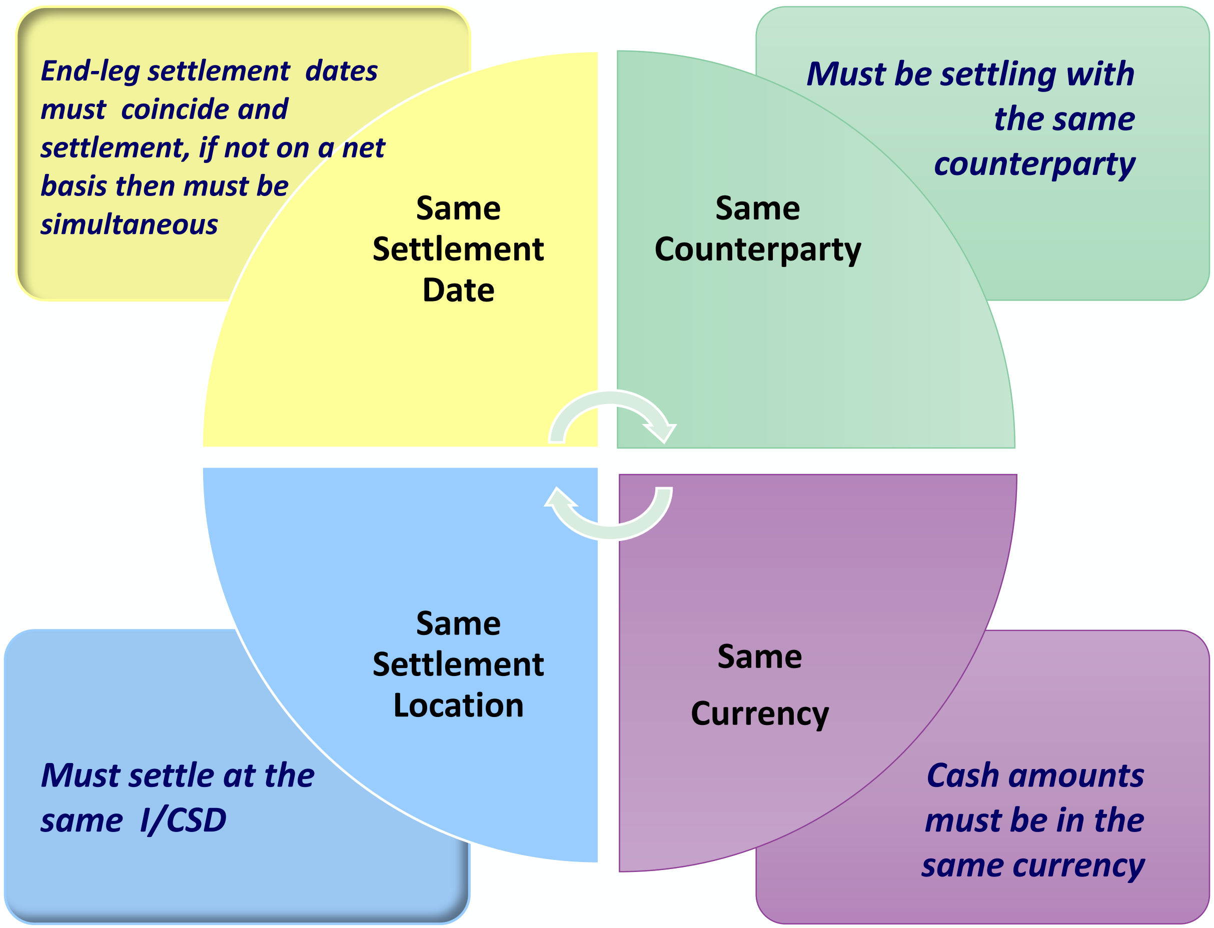
Repos are 'on balance sheet' transactions.

Many major repo market participants have found that their usage of repos is constrained as a result, as each bilateral repo trade requires allocation of balance sheet. The use of LCH as a central counterparty maximises the possibility for banks to net for balance sheet, thereby facilitating longer term repo trading in particular.

Market participants are recommended to consult their own professional advisers regarding the applicability of balance sheet netting rules to their individual organisations

Balance Sheet Netting: The Cornerstones

Key pillars supporting balance sheet netting are:



Participation: Membership Criteria

LCH Ltd	RepoClear Clearing Member (RCM)	Clear own business and/or other RDs
	RepoClear Dealers (RD)	Trade with other RDs, but have **no** direct relationship with LCH Ltd and must sign clearing agreement with approved RCM
LCH SA	Individual Clearing Member (ICM)	Clearing Member authorised to clear own business
	General Clearing Member (GCM)	A Clearing Member authorised to clear own and/or that of Associated Trading Members
	Associated Trading Member (ATM)	A firm that trades on Trading & Matching platforms and has entered into a Clearing Agreement with a Clearing Member
Net Capital Requirement	Clearing own business: Min €100m in clearing member entity	
	Clearing own and third party business: Min €400m in clearing entity	
Credit Assessment (Clearing Members only)	Must satisfy a minimum internal credit score which is determined by the Clearing House based on a range of quantitative and qualitative inputs. These include financial analysis, external market data as well as consideration of any implicit or explicit support available to the applicant	
Regulatory Status (All Participants)	Be authorised and supervised as either a credit institution or an investment firm by the competent authorities of a member state of the EU (or equivalent if outside the EU	

1. Third party clearing members (RCM) are able to offer third party clearing services to Repo Dealers (RD) that are NOT clearing members.
2. Repo Dealers need to meet the same membership criteria as for RCMs except they do not need to meet the credit assessment criteria

LCH: Legal Framework

- LCH operate a number of CCPs within multiple local jurisdictions and each have their own Rulebook and Procedures

- Following Membership approval, Clearing Members utilise LCH services under the legal conditions set out in the relevant Clearing Membership Agreement (CMA) and Rulebook

- The Rulebooks of each CCP are published on the corporate website and they lay out the obligations of both LCH and Clearing Members in relation to the range of clearing services being operated by that CCP.

- As an example, the Rulebook in LCH Ltd is organised as follows:

Rulebook

- General Regulations
- Default Rules
- Settlement Finality Regulations

Procedures

- Section 1 - Clearing Member & Dealer Status
- Section 2B – RepoClear Service

- The relevant parts of LCH Ltd's Rulebook for RepoClear Members are contained in both generic provisions that apply to all Clearing Members and certain provisions specific to just RepoClear.

RepoClear Operating Model

THE FIXED INCOME VALUE CHAIN

Participants execute cash bond and repo trades using an ATS or bilaterally.

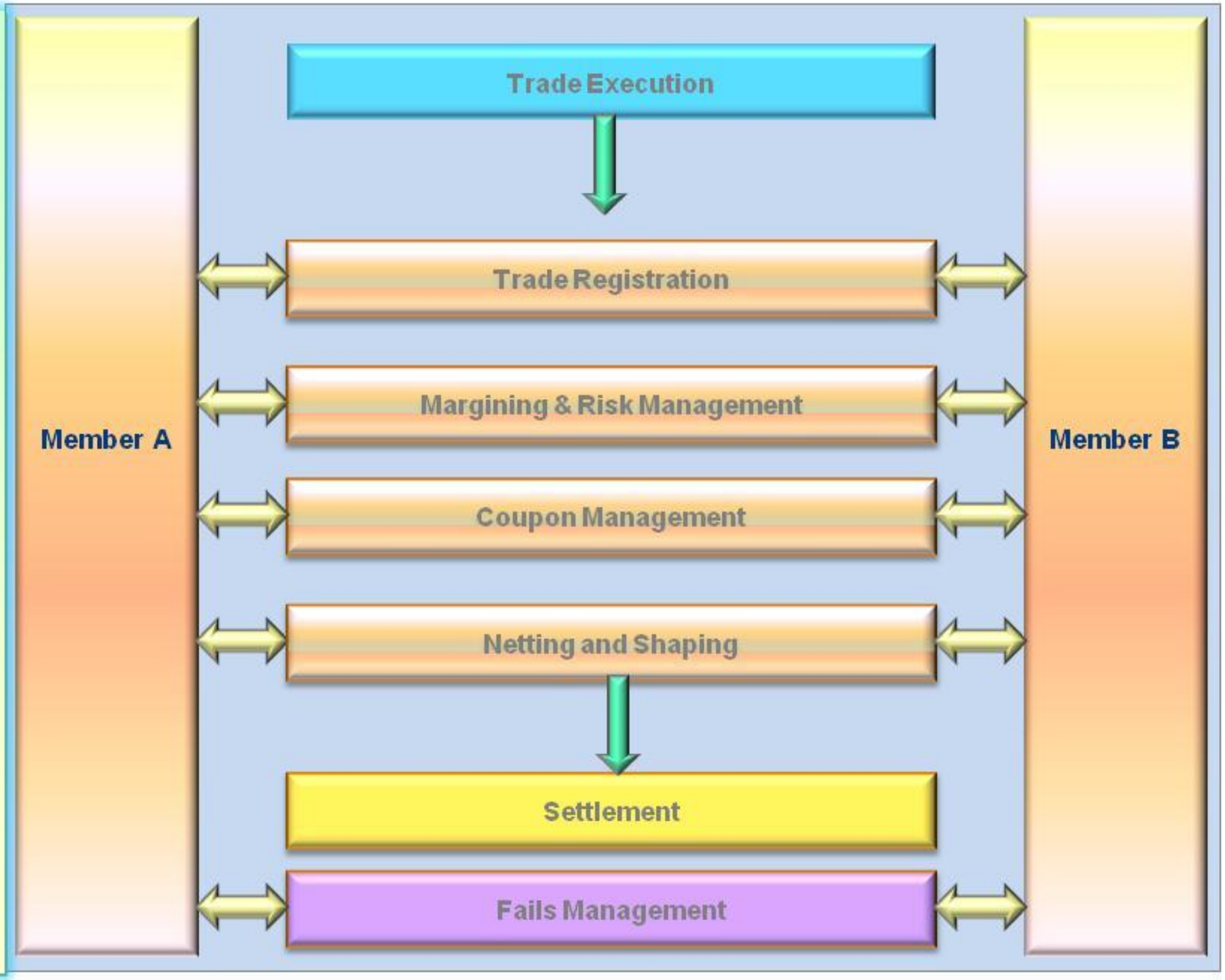
The trades reach LCH.Clearnet for clearing either directly from the ATS or following successful matching of the bilateral trade in ETCMS.

Initial and Variation Margin plus Coupons and fees are then calculated and processed for payment through PPS

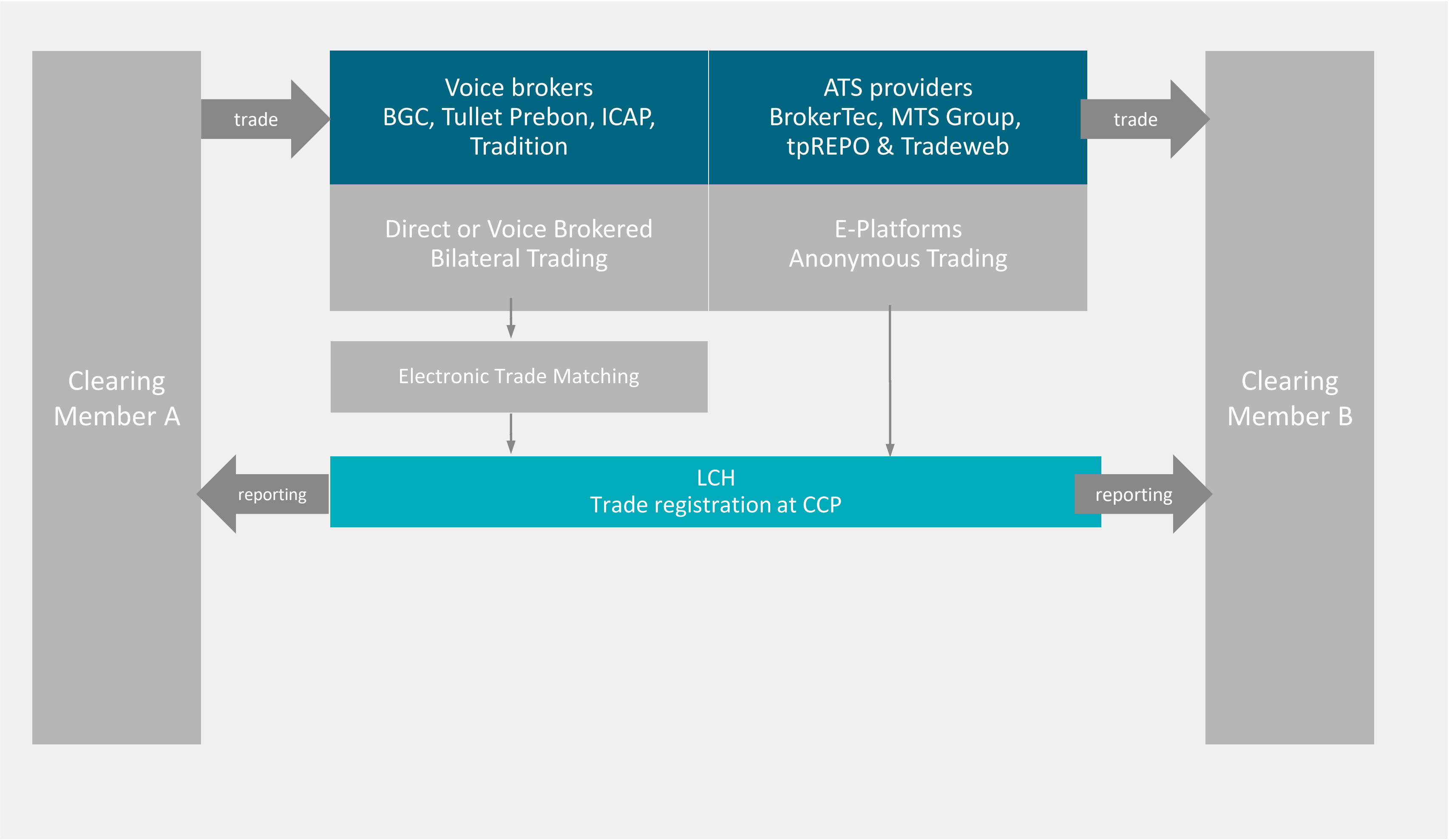
LCH.Clearnet runs a settlement netting process across all open trades to calculate a single net movement in respect of each participant in each ISIN.

LCH.Clearnet then instruct the shaped net settlement requirements to the I/CSD as POA or DI instructions.

All the above events are reported to Clients via a secure Member Reporting Facility



Horizontal Trade Capture Model



Risk Management

Setting the standards for Risk Management

- LCH's robust risk management framework provides its clearing members with exceptional levels of protection. Both the soundness of its risk management approach and the resilience of its systems have been proven in recent times.
- As demand for robust clearing services continues to grow, LCH is committed to setting and maintaining the highest standards across all asset classes cleared.
- The driving force behind our risk management activities is a dedicated team of risk managers, who share a wealth of experience and a convincing record of successfully managed defaults – including Lehman Brothers in September 2008 and MF Global in 2011.

LCH has successfully managed many defaults:

- Drexel Burnham Lambert - 1990
- Woodhouse Drake and Carey (Commodities) Limited – 1991
- Baring Brothers & Co Limited – 1995
- Griffin Trading Company – 1998
- Lehman Brothers International (Europe) - 2008
- Lehman Brothers Special Financing Inc - 2008
- MF Global UK Ltd – 2011
- Cyprus Popular Bank Co Ltd – 2013
- Maple Bank - 2016

Margining and Risk Management

- Standard initial margin (IM) is designed to ensure that LCH has sufficient funds to cover potential losses in the event of the default of one of its Clearing Members in normal market conditions

- IM protects LCH against potential losses that may occur between the time that variation margin (VM) is last paid and when LCH expects to hedge/liquidate a defaulted portfolio

- Risks not covered in the VaR model are subject to additional margins

The Core of IM: VaR

- Initial Margin is based on an Expected Shortfall VaR calculation
- Its basic outline is
  - A 10 year (2500 days) look-back period - Intended to cover at least one economic cycle for historical events
  - Set a 99.7% confidence level to ensure enough margin is held to cover the potential loss of any member's portfolio under normal market conditions, over a 5 day holding period.
  - The historical returns are calculated on a 5-day overlapping holding basis, each return is then scaled by a volatility based function in order to align them with current market conditions.
  - The scaling is floored at percentiles of long term volatility and short term volatility
  - RepoIQ – the RepoClear implementation of VAR - splits the portfolio into sub-portfolios based on the country of risk; the expected shortfall is calculated at sub-portfolio level and the margin requirement of the member's portfolio is then calculated as the sum of the ES of each of the sub-portfolios.
  - It includes the risk towards the underlying bonds and the risk towards the repo and discount rate for ongoing and forward trades

Repo VaR Model Parameters

Parameters	
Holding Period	5 days
Look-Back Period	2500 days
Confidence Level (aim)	99.7%
Risk Measure for IM	Expected Shortfall
Scenario Generation	One tailed
Volatility Scaling	EWMA
Key Risk Factors	•Zero Coupon Sovereign curves •OIS Zero Curves •Repo Zero Curves •FX Rates

Initial Margin vs. Haircuts

- Collateral haircuts are commonly used in B2B transactions as a form of margin:

  Bank A wishes to borrow €100mn cash but is required by its counterparty, Bank B, to deliver €105.26mn value of bond X as collateral.

  This provides Bank B with a 5 % haircut to cover the change in value of bond X post the default of Bank A

- RepoClear Initial margin provides protection against price movements in Bond X in much the same way as a haircut but is administered differently.

  Bank A trades with Bank B (probably anonymously via an ATS) to lend €100mn cash against €100mn value of bond X

  Bank A delivers €100mn value of Bond X to LCH on a DVP basis.

  LCH determine (utilising RepoIQ) that a 5% initial margin is required for the trade today. This margin of €5mn is covered independently to the DVP settlement of the trade itself.

  - The level of initial margin can – and does – change throughout the term of a trade.

Additional Margin

- Reasons for additional margin:
  - High stress testing losses (High portfolio sensitivities)
  - Concentration/liquidity risk
  - Idiosyncratic risk
  - Sovereign credit risk (including wrong way risk)
  - Credit Risk
  - Settlement Liquidity concentrations
  - Any other if needed

Stress Loss over Initial Margin (or DFAM)

- The Default fund is sized on a “cover 2” basis, meaning that it is the stress loss of the 2 biggest members combined plus 10%
- In reverse this means that no member should have a stress exposure over initial margin bigger than 45% (or less if their credit quality is lower)
- STLOIM is calculated and called daily
- It is returned once a week based on the exposures during that week
- Initial Margin for that purpose includes VaR IM, SRF and Credit Rating Based (plus any STLOIM already held)

This Margin will be replaced with Monthly DFAM in the near future

Concentration/Liquidity Risk Framework (CRF)

- The CRF protects LCH, its Clearing Members and the markets it clears from the risk of concentrated positions. A concentrated position is defined as a position that LCH could not close out within the standard holding period at market price. Both market level and single ISIN level concentrations are taken into account

- Applied on a bilateral basis, increasing margin only for Clearing Members with large exposures

- Clearing Members provide regular input on the additional costs associated with trading large positions at ISIN and market level through liquidity surveys and through the Default Fire-drills

Idiosyncratic Risk

- Margin for Idiosyncratic risk is called where the VaR does not cover all risk aspects of a position. I.e. Inflation Linked bonds are currently covered under this framework

Sovereign Risk Framework (SRF)

- The Sovereign Risk Framework aims to address the risk represented by lower credit sovereigns
- The existing and past volatility of the spread is already captured in IM
- The SRF adds a margin based on the cost of credit hedging as implied through the spread between the risk free rate and the YTM of the bonds

Wrong Way Risk (WWR)

- The Wrong Way Risk framework addresses the situation where a significant connection exists between the issuer of the collateral given and the collateral giver
- The framework looks at this situation as if a loan to the sovereign had been given and calculates the risk capital needed
- It is based on the Basel II Advanced Internal Ratings Based model

Credit Ratings

- Every Clearing Member is assigned an internal credit score (ICS), which is calculated using qualitative and quantitative inputs such as financial ratios, market data, support factors and an assessment of operational capability. A deterioration in a Clearing Member's ICS could result in action being taken depending on the level, which can include calling additional margin through margin multipliers or additional margin to cover stress test losses

- Clearing Members will be contacted to explain any action required and what factors are causing the low ICS

Settlement Liquidity Margin

- Designed to address large net buys by a Member on a particular day
- Increases as net buys exceed settlement liquidity limits
- Starts 5 days in advance for the biggest positions and increases until settlement day
- Separate limit and margin for GBP and EUR

Variation Margin

- Daily mark to market (MtM)
- Payable, in cash, in the currency of the contract (called intraday in PPS currency)
- Dependent on the following variables:
  - Repo rate
  - Bond price (bid and ask)
  - Settlement date(s) of repo trade
  - EUR, GBP or USD OIS rate
- Price Alignment Interest (PAI)
  - Calculated and paid/received daily on previous VM balance
  - Currently paid/charged at EONIA, SONIA or USD O/N rate

Delivery Margin

LCH is exposed to additional risks during settlement for three main reasons:

- VM payments via the protected payment system (PPS) are separate from bond settlements at the depositories
- Trades settle at trade price rather than current market price
- VM is returned at S-1

There are two separate scenarios where LCH is exposed to these risks:

- Risk A: Partial settlement at depository
- Risk B: A Clearing Member defaulting after LCH has repaid VM

Default Management Process

RepoClear Default Management Group (RDMG) to advise throughout default management process

Phase 1: Identify defaulting Clearing Member's portfolio & resources

Phase 2: Prepare for auction

Phase 3: Auction process

Phase 4: Loss attribution

The default management process follows the steps above:

1. The defaulting Clearing Member's RepoClear portfolio and its composition will be determined, and possible hedges identified
2. The RepoClear DMG will advise on the hedging strategy and how the portfolio should be split into a set of auction portfolios. The DMG identify and invite an initial subset of RepoClear Clearing Members to participate in the portfolio auction.
3. The auction process will be carried out, in which the selected RepoClear Clearing Members will have the opportunity to bid for the auction portfolio(s). Invited Clearing Members will not be obligated to bid
4. If, once the auction process has completed, the total losses to RepoClear are greater than the financial resources of the defaulter and the relevant proportion of LCH capital, the remaining losses will be allocated, pro-rata, to all of the non-defaulting RepoClear Clearing Members in proportion to their Default Fund contribution

Default Funds

ForexClear	Rates Derivatives	CommodityClear	EquityClear	RepoClear
ForexClear Member Default	Rates Derivatives Member Default	CommodityClear Member Default	EquityClear Member Default	RepoClear Member Default
Defaulter's Initial Margin, Delivery Margin, Contingent Variation Margin and Additional Margins[1]				
Defaulter's Default Fund Contribution				
LCH LTD Capital €12.5mn[2]	LCH LTD Capital €49.5mn[2]	LCH LTD Capital €0.2mn[2]	LCH LTD Capital €1.8mn[2]	LCH LTD Capital €10.0mn[2]
ForexClear Default Fund[2] $1,550mn	Rates Derivatives Default Fund[2] £4,907mn	CommodityClear Default Fund[2] $23mn	EquityClear Default Fund[2] £174mn	RepoClear Default Fund[2] €1,170mn
Unfunded Contributions – Assessment[3]	Unfunded Contributions – Assessment[3]	Unfunded Contributions – Assessment[3]	Unfunded Contributions – Assessment[3]	Unfunded Contributions – Assessment[3]
Service Continuity – VM Haircutting[4]	Service Continuity – VM Haircutting[4]	Service Continuity – Loss Distribution[4]	Service Continuity – Loss Distribution[4]	Service Continuity – Loss Distribution[4]
Voluntary Service Continuity	Voluntary Service Continuity	Voluntary Service Continuity	Voluntary Service Continuity	Voluntary Service Continuity
ForexClear Service Closure	Rates Derivatives Service Closure	CommodityClear Service Closure	EquityClear Service Closure	RepoClear Service Closure

1. LCH LTD held margin collateral with a market value of €154bn on 31st March 2017.
2. The size of each prefunded Default Fund and an indicative allocation of dedicated capital are as at 31st March 2017.
3. Assessments are callable up to the value of each member's Default Fund contribution at the time of the default.
4. Further resources are available in the service continuity phase as determined by the [LCH LTD Rulebook.]

Useful Information on RepoClear

RepoClear Ltd

- Link to Clearing House Procedures, including:
  - Section 1 – Clearing Member and Dealer Status
  - Section 2B – RepoClear Clearing
  - Section 3 – Financial Transactions
  - Section 4 - Collateral
- http://www.lch.com/rules-regulations/rulebooks/ltd

- Links to Risk Related Information:
- RepoClear Margin Rates and Margin Circulars
  http://www.lch.com/risk_management/ltd/margin_rate_circulars/repoclear/default.asp

- Risk Management Overviews
  http://www.lch.com/risk-collateral-management/risk-management-overview

RepoClear SA

- Links to Rulebook:
  http://www.lch.com/rules-regulations/rulebooks/sa

- Links to Risk Related Information:
  Bond & Repo Margin Rates and Margin Circulars
  http://www.lch.com/risk-collateral-management/margin-methodology/sa-bonds-repos

RepoClear

Sponsored Clearing

Sponsored Clearing: Regulatory Drivers

Regulatory Reform

Regulations introduced by BCBS aimed at increasing bank capitalisation, reducing bank liquidity risk and constraining bank leverage are creating new challenges in the Repo markets as Banks prepare for full implementation. The measures include the introduction of:

Leverage Ratio

Increases the required Tier 1 Capital to be held against on and off-balance sheet exposures. This leads to a reduction in available balance sheet for client activity, likely increasing its cost.

Liquidity Coverage Ratio (LCR)

Increases banks' requirement to hold High Quality Liquid Assets (HQLA) to be able to meet net cash requirements during market stress events (over 30 days).

Net Stable Funding Ration (NSFR)

Introduces a minimum obligation for the amount of stable funding over a one-year timeline, based on risk factors allocated to assets, contingent funding obligations and off-balance sheet liquidity exposures.

Balance sheet is becoming a scare resource, and intermediaries are more discerning in its allocation to customer activity.

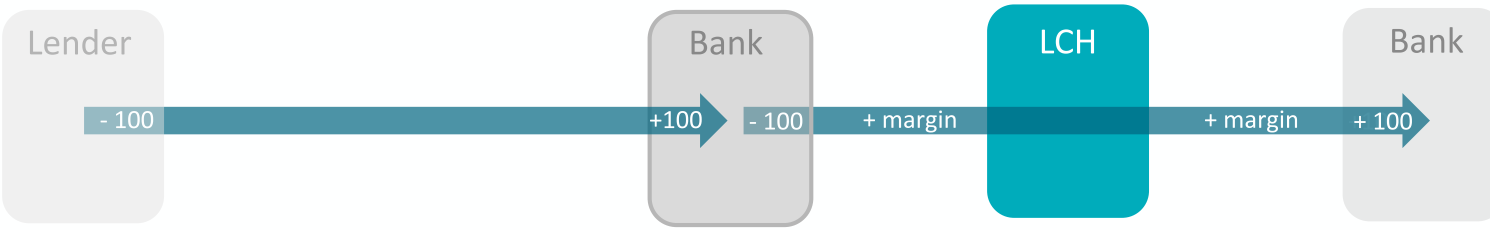
Impacts on market participants in securities financing transactions

The costs incurred by bank intermediaries are starting to be applied directly to transactions. Market participants can face:

- **Widening financing spreads**
  Potentially impacting market liquidity and efficiency overall
- **Reductions in capacity**
  Banks reduce their role as intermediaries and liquidity providers as balance sheet is carefully allocated to customers

Netting Efficiencies With RepoClear: How It Works

INTER-DEALER ONLY CLEARING



With Sponsored Clearing, LCH becomes the counterparty to each cleared transaction, creating opportunities for balance sheet, capital and settlement efficiencies.

BALANCE SHEET NETTING

Balance sheet netting typically requires the following:

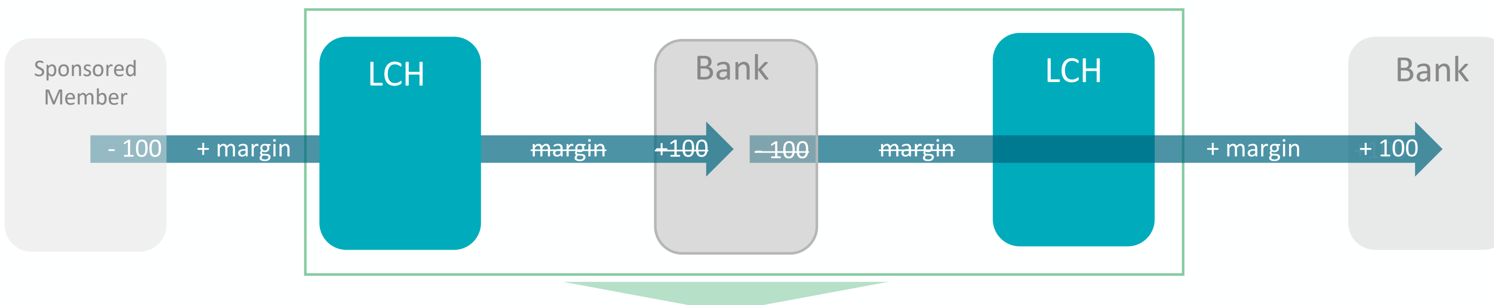
01. The same counterparty

02. The same currency

03. The same settlement date

04. The same settlement location

SPONSORED CLEARING

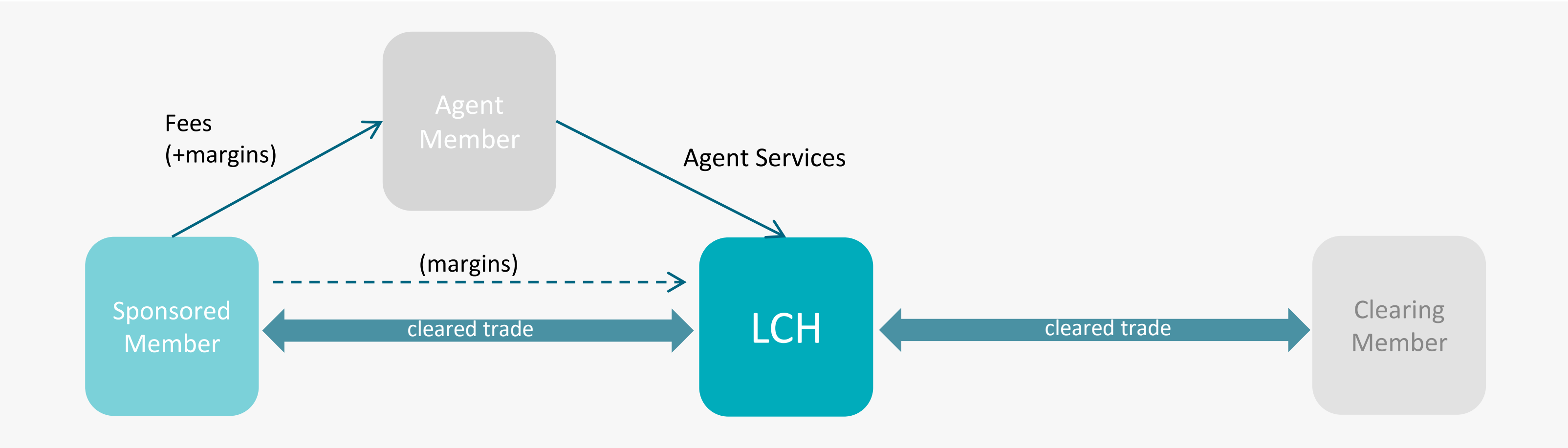


NETTING BENEFITS

The Bank faces LCH for both the repo and reverse repo, allowing for:

- ✓ Balance Sheet Reduction
- ✓ Margin Offsets
- ✓ Settlement Efficiencies (if same security)

Sponsored Clearing Model Overview



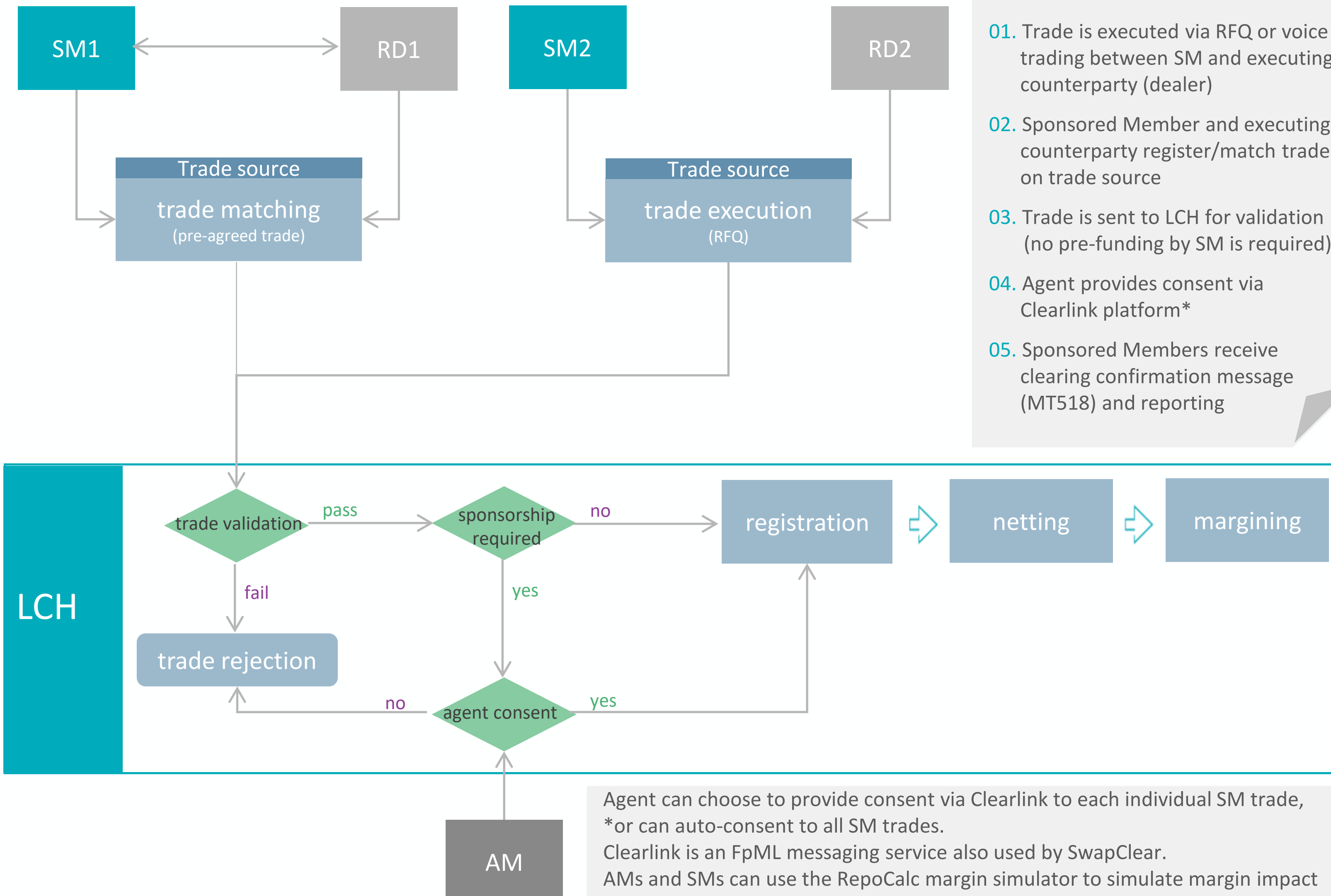
Sponsored Member Responsibilities

1. **Direct transactional relationship with LCH**
   The Sponsored Member is LCH's direct counterparty for each cleared trade
2. **Trade Settlement**
   The Sponsored Member settles directly with LCH (or through their Custodian/Settlement Agent) - the Agent does not guarantee performance
3. **Margin Liability**
   The Sponsored Member is responsible for all margins to the CCP – margin payments are facilitated by the Agent Member

Agent Member Responsibilities

1. **Default Fund Contributions / Waterfall**
   The Agent Member provides Default Fund Contributions
2. **Agent Resources**
   The Agent provides an Agent Buffer as a pre-funded resource for margin payments, and an ARC as an additional layer in the default waterfall
3. **Margin Management**
   The Agent facilitates the payment of the Sponsored Member's margins in a Paying Agent capacity via its PPS account

Trade Registration



TRADE REGISTRATION STEPS

01. Trade is executed via RFQ or voice trading between SM and executing counterparty (dealer)

02. Sponsored Member and executing counterparty register/match trade on trade source

03. Trade is sent to LCH for validation (no pre-funding by SM is required)

04. Agent provides consent via Clearlink platform*

05. Sponsored Members receive clearing confirmation message (MT518) and reporting

Agent can choose to provide consent via Clearlink to each individual SM trade, *or can auto-consent to all SM trades.
Clearlink is an FpML messaging service also used by SwapClear.
AMs and SMs can use the RepoCalc margin simulator to simulate margin impact of new trades.

Netting and Settlement

Netting - European markets

- All registered trades due for settlement next valid business day or same day (depending on when the trade was registered) will be netted at RepoClear Dealer (RD) level, issue and per market
- Both cash trades and repo trades are netted together
- Cash only movements per issue are also netted to produce just one cash movement per Clearing Member per Central Securities Depository (CSD) per netting run
- Obligations may be shaped depending on size of position

Netting - Gilts/Term £GC

- All registered trades due for same day settlement will be netted at RD level and issue
- Both cash trades and repo trades are netted together
- Cash only movements per issue are also netted to produce one cash movement
- Obligations may be shaped depending on size of position
- Same day Term £GC obligations netted at same time as Term £GC interest for S+1
- (Agents cannot act as custodians for Triparty products)

Responsibility for Settlement

- For each Sponsored Member account, the SM will settle via their own CSD account, which may be administered by (i) themselves, or (ii) their Agent, or (iii) a Third Party Custodian.
- LCH instructs settlement to the account designated by the Sponsored Member at on-boarding on a market by market basis

Sponsored Clearing Benefits the Wider Membership

Bank Benefits

In a context of regulatory change and increasing pressure on Banks' balance sheets, the Sponsored Clearing model seeks to deliver capital efficiencies while enhancing existing transactional and clearing relationships. Benefits to banks include:

1. **Balance Sheet and Settlement Optimization**
2. **Enhanced Transactional Relationships**
3. **Increased Capacity**

Sponsored Member Benefits

Sponsored Clearing extends the benefits of direct CCP membership to the broader investor community in a model specifically designed for the buy side. Benefits to Sponsored Member of the model include:

1. **Increased Capacity**
2. **Operational Efficiency**
3. **Risk Reduction**

Client Clearing: To clear or not to clear – the challenges of funding and financing for the buy-side

Frank Odendall, Senior Vice President, Deutsche Börse - Group Global Funding & Financing (GFF) Sales

DEUTSCHE BÖRSE GROUP

Access to the centrally cleared Eurex Repo interbank repo market for the buy-side

Frank Odendall, Global Funding & Financing (GFF), Deutsche Börse Group

June 2017

1

Why trade CCP cleared repos?

What are the challenges for a treasury, portfolio, collateral and risk manager in 2017 and onwards?

1. Funding of Initial Margin (IM) and Cash Variation Margin (VM) from mandatory cleared IRS Clearing or Uncleared Derivatives

2. Secure, efficient and profitable placing of cash despite shrinking bank balance sheets

- Hold more collateral locked up at CCPs (cash or non-cash) or at secure Third Parties
- Raise or place cash at short notice to meet/ manage cash VM obligations
- Negotiate new CSAs and amend collateral schedules whilst continue to monitor “old” existing CSAs and collateral agreements

Why trade CCP cleared repos?

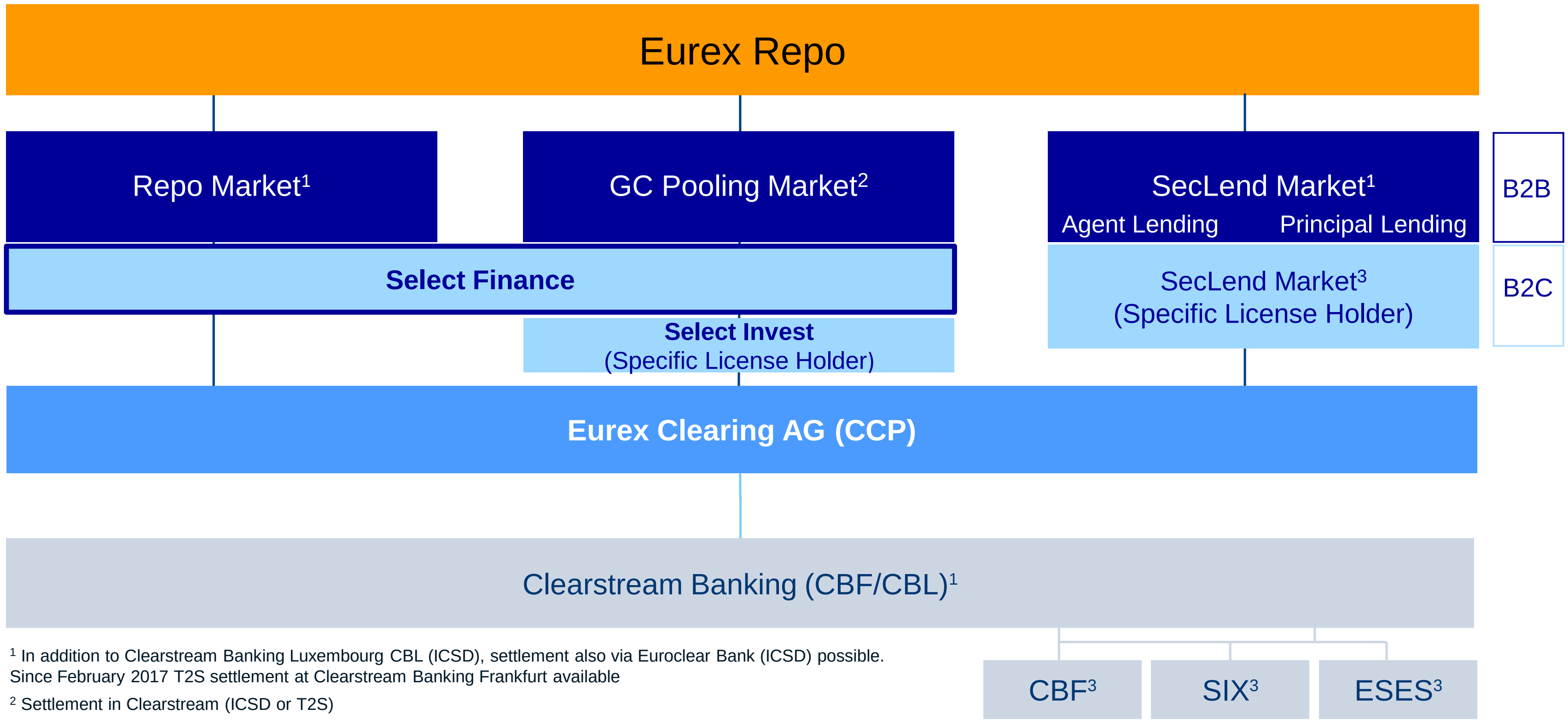
- There are **three distinct advantages of CCP cleared repos on Eurex Repo** relative to non-CCP cleared (bilateral, TriParty) repos:
  1. **Operational** – netting of exposures under one set of documents as well as automated collateral and cash management via Clearstream (for GC Pooling)
  2. **Liquidity** – trading with 150+ financial institutions in EUR, USD, CHF and GBP vs. 20,000 ISINs with SameDay settlement for tenors from Overnight to 2 years via RFQ
  3. **Safety** – mutual margining of all repos and proven Default Management Process at Eurex Clearing AG (CCP) minimizes the risk of market disruption
- **Banks** providing liquidity to buy-side firms **can achieve balance sheet netting**

2

Eurex Repo market, liquidity and trading

What is Eurex Repo?

- **Eurex Repo is** a **BaFin regulated** electronic Multilateral Trading Platform (MTF) and part of Deutsche Börse Group
- It is the leading European marketplace for international secured funding and financing with **150+** participants and more than **1200** users since 2001
- It offers integrated markets for electronic trading, clearing, collateral management and settlement of repo and securities lending transactions**. All transactions are centrally cleared at Eurex Clearing AG**, a qualified CCP
- Its **GC Pooling Market** is the European **benchmark** for standardised secured funding with central clearing.



[1] In addition to Clearstream Banking Luxembourg CBL (ICSD), settlement also via Euroclear Bank (ICSD) possible. Since February 2017 T2S settlement at Clearstream Banking Frankfurt available

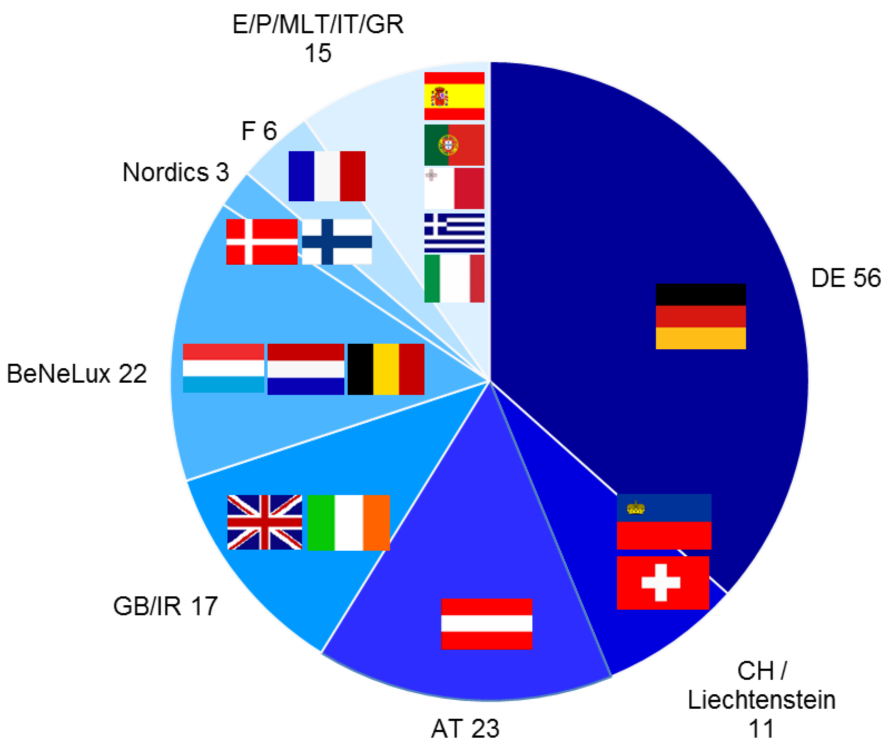
[2] Settlement in Clearstream (ICSD or T2S)

[3] Home market settlement for EQ loans

Eurex Repo – Pan-European Participants Structure

Geographical Expansion as of April 2017

Continuous growth of participants across Europe



Total: 155 Participants
Thereof: 136 GC Pooling and 147 Repo Market

Type of participants

- Credit institutions
- Central banks e.g. Banque Centrale du Luxembourg, Swiss National Bank
- Finance Agencies e.g. German and Dutch Finance Agency
- German regional countries
- Supranational organizations e.g. European Investment Bank (EIB), EFSF, ESM
- Corporates and Insurance Companies (Select Invest and Select Finance participants)
- Brokers

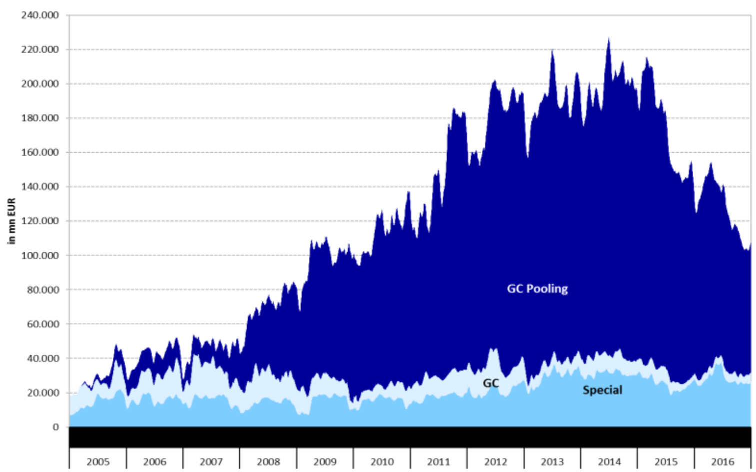
Comparison GC Pooling versus Repo Market (Specials/ GC)

Different market concepts fulfil different customer needs

GC Pooling Market	Repo Market
Funding	Financing
• Cash driven basket trading • Funding in EUR, USD, CHF, GBP collateralized by 4 collateral baskets • Automated allocation of securities and straight-through-processing provides efficiency (STP) • Triparty collateral management service via Clearstream Luxembourg or Frankfurt (mandatory) • Real-time substitution of collateral • Settlement netting on basket / currency level • Efficient re-use of collateral baskets to ECB/Bundesbank or BCL & Eurex Clearing margining	• Securities driven trading • Financing of single securities & specific collateral baskets against EUR and GBP • Manual allocation of securities allows selective collateralization (STP) • Possibility to limit the number of allocated collateral • Single ISIN settlement and choice • Settlement netting on single ISIN level • Full flexibility of re-use

Eurex Repo provides continuous liquidity even during times of stress

Average outstanding volume: Breakdown by market & segment



20 day moving average/single counted

- Central bank liquidity is the key driver of GC Pooling repo rates
- Correlation between Excess Liquidity and GC Pooling Volume:

  2014: -0,33

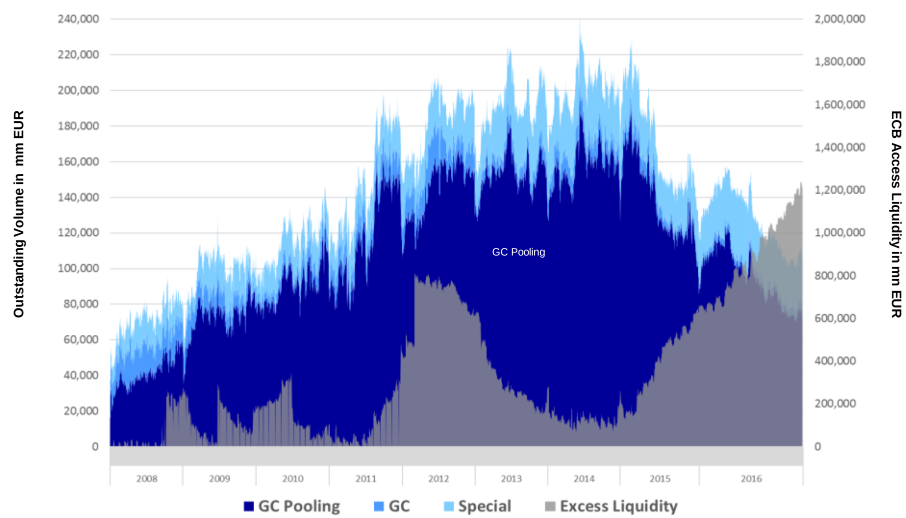
  2015: -0,94

  2016: -0,89

  ➢ **GC Pooling liquidity represents substitute to central bank liquidity**

Key Figures & News

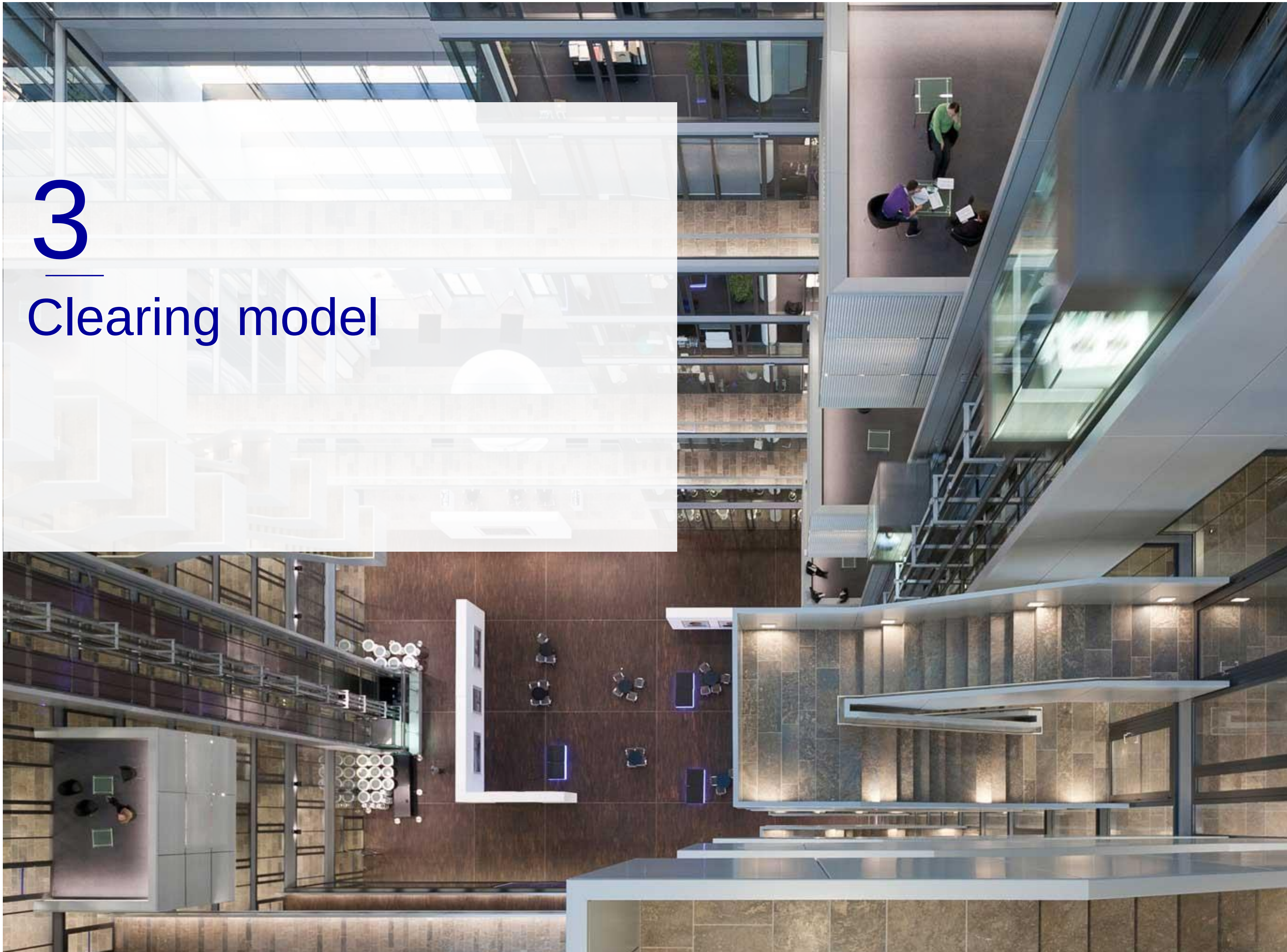
- Daily outstanding volume record € 245.9 bn reached on June 12, 2014
- Specific ISIN Repo (GC & Special):
  Daily average 2,000-3,000 special repo quotes uploaded for inventory trading



Source: Bloomberg and Eurex Repo

3

Clearing model

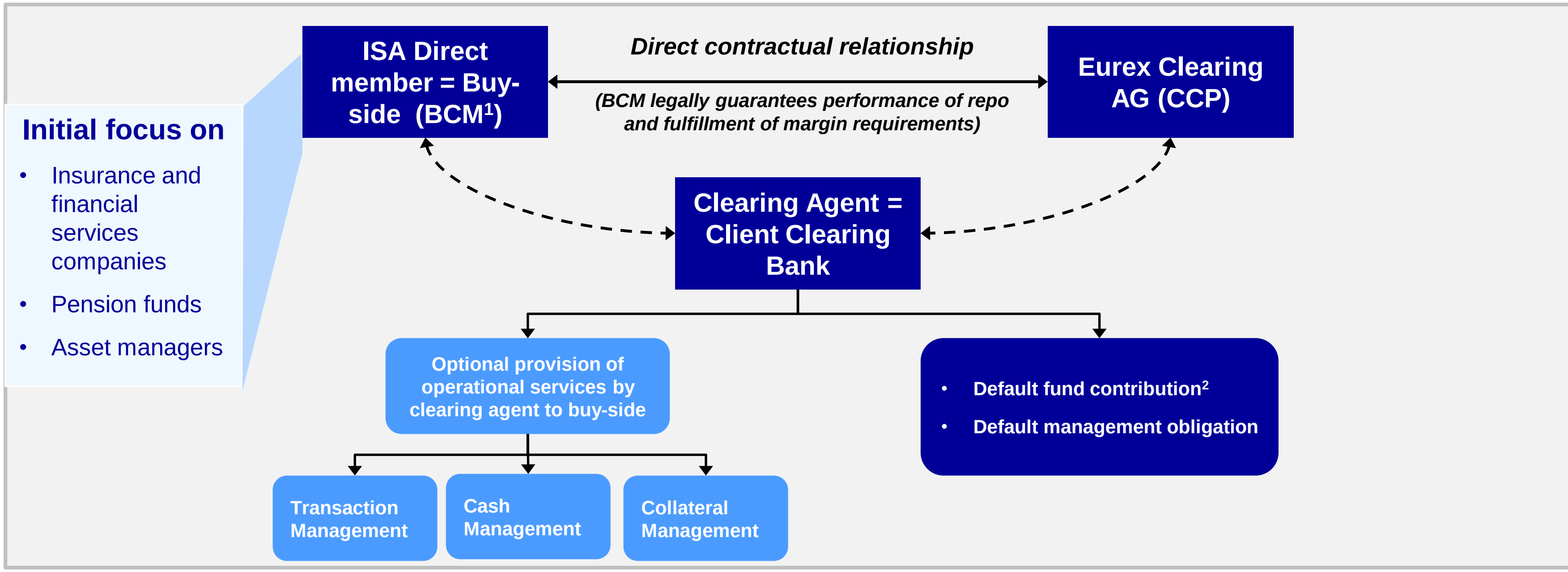


There are three major differences between CCP cleared and non-CCP cleared repos

Executive Summary

1. **Counterparty to all repos is Eurex Clearing AG (CCP)**
   - ➢ Access to trade with 150+ banks over same operational platform
   - ➢ Only one credit relationship needs to be assessed and monitored
   - ➢ Multiple lines of defence protect against losses, e.g.
     - Initial margin paid by repo trading counterparties
     - Eurex Clearing contributions incl. parental guarantees of Deutsche Boerse
     - Default Fund contributions of all Clearing Members
     - Principle repo collateral received via full title
2. **Eurex Clearing Conditions (German law) governs all transactions**
   - ➢ No bilateral GMRA negotiations or updates required
   - ➢ React to regulatory changes more effectively
3. **A Clearing Agent funds the Clearing Fund contributions of a buy-side`s repo** (approx. 7% of the IM and potentially two assessments of 7% each)
   - ➢ No mutualisation of risk for buy-side
   - ➢ In comparison to standard IRS Clearing models, very limited position porting issue as principal repo transactions are between buy-side and CCP

Select Finance - ISA Direct reduces the counterparty and operational risk for the buy-side significantly



New client model with a new principal client relationship between buy-side clients and the CCP

Existing Clearing Member acts as Clearing Agent

The Buy-side has to meet admission criteria equivalent to regular clearing members with extended servicing functions by the clearing agent

[1] BCM = Basic Clearing Member
[2] Default fund contribution is approx. 7% of IM plus potentially 2 further assessments of approx. 7% of IM

Appendix

Baskets of the GC Pooling Market

GC Pooling Basket Overview

Fixed Income

GC Pooling ECB Basket

- Based on the ECB's Eligible Assets Database (EAD)
- LCR Level 1 compliant
- **Approx. 4,000 ECB eligible securities**
  - Instruments of Central Banks, Central Governments, Regional/Local Governments and Supranationals: Min rating "A-/A3"
  - Traditional and Jumbo "Pfandbrief"-style instruments of credit institutions and Agency Credit Institutions: Min rating "AA- and LCR HQLA compliant
  - Location of bond issuance: Austria, Belgium, Germany, Netherlands, France, Slovenia, Eurobonds
- Tradable in EUR, USD, CHF and GBP
- Re-use of received collateral with ECB/ Bundesbank and Eurex Clearing (margining)

GC Pooling ECB EXT Basket

- Based on the ECB's Eligible Assets Database (EAD)
- **Approx. 14,000 ECB eligible securities**
  - Excluded are (Treasury) Bills, Commercial Papers and Certificates of Deposit issued by corporate issuers and Agency Non-credit Institutions as well as all assets defined as ABS/MBS and other securitized bonds
  - Location of bond issuance: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Malta, Slovenia, Spain, Netherlands, Eurobonds
- Tradable in EUR, USD, CHF and GBP
- Re-use of received collateral with Eurex Clearing (margining)

GC Pooling INT MXQ Basket

- Based on the Admissible Securities list of Eurex Clearing
- Min rating "AA-/Aa3"
- **Approx. 2,000 eligible securities** from central banks and supranational issuers
- Bonds may be denominated in AUD, CAD, CHF, DKK, EUR (only non-ECB eligible), GBP, JPY, NOK, SEK and USD.
- Tradable in EUR, USD, CHF and GBP
- Re-use of received collateral with Eurex Clearing (margining)

Equity

EQ GC Pooling Basket

- Components of AEX25, CAC40, EUROSTOXX50, DAX
- **Approx. 104 components**
- Tradable in EUR, USD, CHF, GBP
- Equity Collateral Haircut between 7-20%
- Corporate Action (income and non-income events): Compensation payments
- Corporate Action (non-income events): To be treated as ineligible and substituted out of the collateral pool
- Re-use of received collateral with Eurex Clearing (margining)

Baskets of the Repo Market (GC & Special) with approx. 7,000 eligible ISINs

Basket Overview

Fixed Income

German Baskets

- German GC
- German 10 Year GC
- German Corporate Bond GC
- German Jumbo Pfandbrief GC
- German Pfandbrief GC
- German Laender GC
- KfW GC
- Special DE Basket

European Baskets

- Agency GC
- EIB GC
- European Corporate Bond GC
- Austrian Government GC
- Belgian Government GC
- Finish Government GC
- French Government GC
- Dutch Government GC
- Spanish Government GC
- European Government GC
- European Covered Bond GC
- French Covered Bond GC
- European Government GC
- German Government Guaranteed GC
- EFSF GC Basket
- UK Gilt Basket
- Special Basket

Special Repo
All bonds belonging to the mentioned baskets can be traded special

ICMA Workshop: Professional Repo and Collateral Management
1-2 June 2017

Alternatives to CCPs in emerging markets

Ingrid Hagen, Vice President Strategic Projects, Frontclear

frontclear

A financial markets development company

2 June 2017

ICMA Workshop: Professional Repo and Collateral Management

Frontclear mandate and instruments

Stable, inclusive and
liquid local interbank markets in EMDC

1 Financial guarantees to enhance local currency collateral

reinforcing

2 Technical assistance to address other hurdles

BMZ Federal Ministry for Economic Cooperation and Development

FMO Entrepreneurial Development Bank

fsdafrica

European Bank for Reconstruction and Development

Proparco GROUPE AGENCE FRANÇAISE DE DÉVELOPPEMENT

TCX the currency exchange fund

cardano development

UKaid from the British people

KFW Bank aus Verantwortung

Established in 2015 – currently USD 212.3m in risk capital + USD 1m in technical assistance funds

Building stable, inclusive and liquid interbank markets

Stable	Inclusive	Liquid
Global financial crisis transmitted via interbank markets G20 reforms have pushed for CCP and collaterilazing bilateral trades with HQLA Lack of international HQLA reduced access for EM based banks to global markets **Frontclear credit enhances local currency collateral**	Tier 2 and Tier 3 banks often serve SME / underbanked segments of the market Creating access for these institutions unlocks local comparative advantages and facilitates responsible financing and inclusive economic growth **Frontclear TA looks to improve systems and connect participants**	Liquid interbank markets allow for optimal distribution of liquidity and risk Liquid interbank markets allow for price discovery and optimal pricing of liquidity and risk Liquid interbank markets are more responsive to monetary policy signals

Frontclear in short

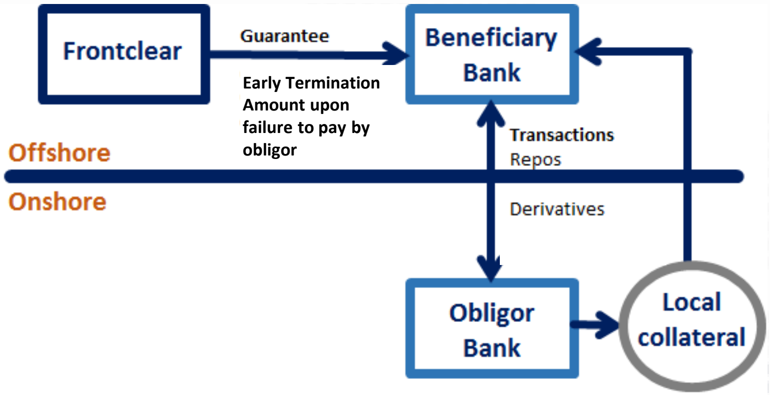
- Frontclear is a financial markets development company focused on catalyzing more stable and inclusive financial markets in emerging and developing countries.

- Frontclear facilitates more competitive access to interbank markets through issuance of Basel III compliant credit guarantees to cover a transacting institution’s (the obligor) counterparty credit risk.

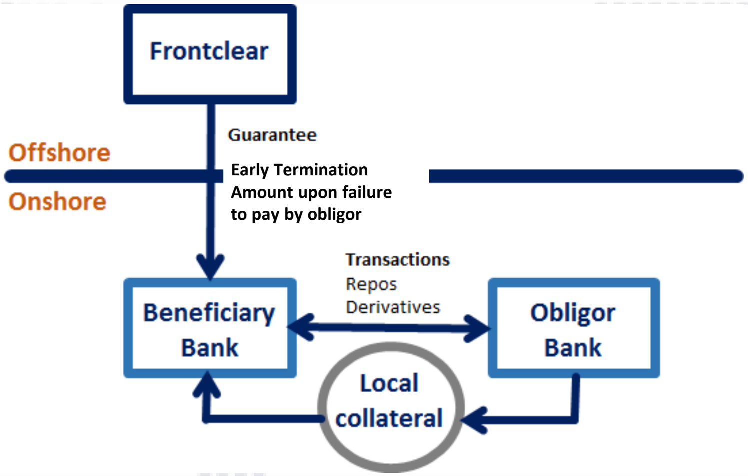
- Frontclear covers money market instruments including repo’s and cross-currency repo’s, derivative instruments including FX spot, forwards, FX swaps and cross-currency swaps, and securities financing transactions.

- Frontclear Technical Assistance Program (FTAP) focused on:
  - Capacity building of obligors and regulators
  - Regulatory reform
  - Legal enforceability
  - Market infrastructure development

Frontclear Guarantees – OTC Transaction Structures



Introducing additional liquidity from foreign investors



Redistributing existing liquidity and promoting policy signals

Transaction

Kenya

Cross-currency repo transaction guaranteed by Frontclear

1st of its kind transaction in Kenya

Supporting the development of a more inclusive interbank market in Kenya

Commercial Bank of Africa (CBA) and Standard Bank of Southern Africa (SBSA) executed a USD 25 million cross-currency repo transaction
The deal was facilitated and guaranteed by Frontclear

www.frontclear.com

Frontclear is supported by

Transaction

Nigeria

Cross-currency swap with a Frontclear guarantee

First guarantee in West Africa
Entirely collateralized in Naira and first of its kind in Nigeria

Swap enabled short term liquidity in challenging market environment

Standard Chartered executed a USD/NGN 15 million 1 year cross-currency swap for Access Bank leveraging a custom guarantee issued by Frontclear

www.frontclear.com

Frontclear is supported by

Frontclear TA Program (FTAP) – achievements to-date

± 350 obligors and regulators trained in 2016

13 trainings + 2 research + 6 advisory = 21 activities, of which ± 70% in Africa

"The activity contributed to your skills, knowledge and/or awareness"

70% Strongly Agree   28% Agree

value at < USD 1000 per participant per course (all-in)

> 80 citings in local and global media including:

- CNBC East Africa TV interview
- Global Investor Magazine
- Global Banking and Finance
- Business Daily Africa
- ICMA Quarterly
- Presentations at JSE, ICMA ERCC, BOZ Treasurers Meeting, AFSIC and more
- Numerous local publications such as the Ghanaian Times, FT Sri Lanka and many more

8 TA country strategies based on full capital markets analyses

6 official partnerships with local regulatory agencies and/or market associations including Kenya Capital Markets Authority, Ghana Stock Exchange, Zambia ACI, Central Bank of Honduras, + 2 agreements in process

2 regulatory reform processes – 1 in Kenya (in process) and 1 in Georgia (completed)

FTAP case

Global research

- Hybrid OTC Exchanges: costs and benefits to the interbank market (Q1 2017) followed by 2 regional workshops (East Africa and West Africa)
- Money markets and interbank markets: best practice and learning (Q3 2017)
- Primary Dealer systems: best practices and learning (Q4 2017) followed by 2 regional workshops (EA and WA)

Latin America

- Honduras: HSE and Central Bank partnership towards regulatory reform on GMRA

CIS

- Georgia: NBG Central Bank partnership on GMRA enforceability through a bespoke legal opinion. Reformed regulation and improved commercial understanding and application of GMRAs training

West Africa

- Cote d'Ivoire: Understanding and applying ISDA workshop for obligors completed.
- Ghana: GSE/GFIM (Central Bank) 2-year partnership. FIBC and Basel II/III training completed.
- **Nigeria: FMDQ partnership including cost/benefit analysis of OTC Exchange settlement guarantee**
- West Africa Regional Programme (Q2 2017)

Asia

- Vietnam: Country Programme approved and focus is on regulatory harmonisation

East Africa

- Kenya (see next slide)
- Zambia: ACI Zambia partnership. Legal opinion developed on GMRA and ISDA enforceability and presented in workship with BOZ and treasurers. FIBC and ISDA/Derivatives/Derivatives Accounting completed.
- Uganda: ACI Uganda partnership. Country Programme beginning Q1 2017.
- Rwanda: Country Programme beginning Q1 2017.

Special Project – Umbrella Guarantee Facility (UGF) in Kenya

Challenge

- Segmented interbank market wherein tiered banks are trading in isolation and liquidity is not flowing, primarily due to credit risk concerns among market participants (recent defaults)

Solution

- UGF to provide a credit risk free trading window to reduce this segmentation, which doesn’t replace current open trading lines but adds more stable trading capacity that can better guard against market shocks and stress
- Complemented by technical assistance to build global best practice

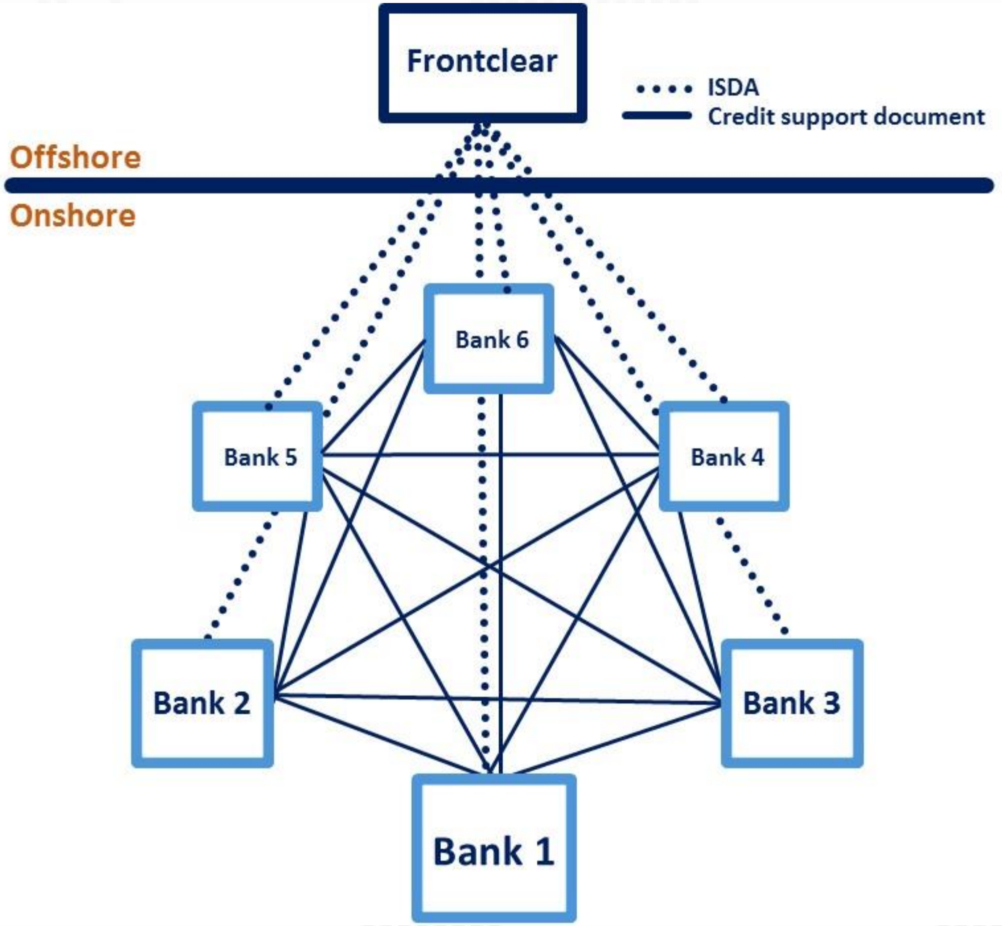
Approach

- Frontclear guarantees losses up to USD 30m due to counterparty failure to all participating banks
- All transactions documented under a standard ISDA and local CSA
- All transactions are negotiated and executed bilaterally as per current market norms
- Posting of collateral is on a bilateral basis with Frontclear acting as valuation agent
- In the event of a default by one or more participants, transactions are closed-out with the defaulting counterparty. Any positive early termination amount due to non-defaulting counterparties then covered by Frontclear up to a certain maximum amount

Coverage

- Trading instruments covered include: Spot FX, FX Swaps, Forwards, Cross currency swaps and repos (only title transfer based supported)
- Tenors of up to 3 months
- Individual market participants can open credit lines of up to USD 15 million or max 35% of equity

Special Project – UGF in Kenya



A 'start-up' to a CCP without the legal/regulatory licensing and requirements

- No novation of trades
- Frontclear Clearing (FCC) cannot step in in case of default
- No multilateral netting benefits
- Finality of settlement through local RTGS payment & settlement system

Special Project – UGF in Kenya

Benefits for participants

- Stable trading window that will allow treasury to manage liquidity and risk in differing market conditions
- Access to 10+ counterparties for trading and thus greatly enhanced price discovery and competition
- Significant capacity building and training as part of the implementation plan

Benefits for market makers

- Opportunity to extend trading to smaller counterparties that otherwise cannot be faced
- Capital relief for market makers subject to Basel II/III

Benefits for the market

- Return to interbank market liquidity among different bank tiers that is more stable against shocks
- Centrally coordinated execution of a standard ISDA and local currency CSA in the market
- Development of a market agreed valuation curve for swaps and repos
- Coverage of settlement risk and elimination of cumbersome DVP structures
- Quick implementation and a first step towards centrally cleared market structure

Comparison of Frontclear 'clearing' models

	Bilateral	UGF	CCH	CCP
Counterparty	Bilateral, 2 counterparties	Bilateral, multiple counterparties	Bilateral, multiple counterparties	CCP is legal counterparty
Trading	Structured trades, pre-approved	Flow trades, automatic coverage		
Collateral	Bilateral, negotiated, counterparties are valuation agents	Bilateral, standardized, FCC as valuation agent	Multilateral, standardized, CCH as valuation agent	Multilateral, standardized, CCP as valuation agent
Guarantee documentation	ISDA + Bilateral Guarantee, trade specific	ISDA + Bilateral Guarantee, non-trade specific	Multilateral netting agreement required, Guarantee to CCH	Legal framework must support CCP powers, specific legislation required, Guarantee to CCP
Rule book	None	Guarantee doc	SEC approved	SEC approved
Risk management	Bilateral	Bilateral, central valuations by FCC	Centralized risk model	Centralized risk model
Financial resources	Initial margin, haircuts, VM, FCC Capital	Settlement reserve account, VM, FCC Capital	Margin posted to CCH, Settlement Guarantee Fund, CCH capital, guaranteed by FCC	Margin posted to CCP, Settlement Guarantee Fund, CCP capital, guaranteed by FCC, Mutualized default fund, CCP resolution
Risk profile	Full MtM loss	MtM losses up to cap, settlement losses by settlement reserve	Risk waterfall, losses up to cap	Risk waterfall, losses up to cap

Thank you

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T2S and what it means for repo

Nicholas Hamilton, Executive Director, JP Morgan

TARGET2-Securities (T2S): Overview

What is Target 2 Securities?

At its core:

- T2S is an advancement on the notion of TARGET2, a cash settlement engine used in the Euro-system. It is the second generation of the TARGET infrastructure run by the European Central Bank.
- TARGET2-Securities (T2S) is the new “settlement box” for Euro-system securities trades, covering Repo, Cash, Security Lending & equities
- T2S is not a Central Securities Depository! It is a securities settlement system.
- A technical interface to overcome a fragmented regional operating model.

What is Target 2 Securities?

- T2S is an initiative from the Eurozone central banks to **centralise** equities and bond **settlement** across 24 Eurozone CSDs on a **single pan-European platform**. It is a large-scale project, which will fundamentally change processing of securities transactions across the Eurozone markets.

- T2S aims to **reduce the costs and risks** of cross-border settlement**,** as well as **foster competition** and promote **greater harmonization.**

- T2S is **live** now from the **4 waves** between June 2015 and March 2017. The final wave is planned in September 2017.

- Together with the CSD regulation, T2S has & will result in **mandatory, regulatory and infrastructure changes** across Europe. While firms have various access options, **all options** will require system and process **upgrades**:
  - All CSD settlement in Euro of the participating CSDs will migrate onto T2S following new ISO 20022 standards.
  - Settlement and other related processes will be largely harmonised across European markets.
  - Settlement cycles have been shortened to T+2 for go live into T2S with the introduction of a settlement discipline regime inflight through CSDR

- T2S is also changing Euro liquidity processing and will allow **cash netting** of settlement and **collateral optimisation** across Euro markets. This will allow centralisation of T2S cash liquidity on Central Bank cash accounts and will aid in complying with Basel III liquidity requirements.

Why was T2S initiated ? Overcoming the Giovannini Barriers

- The Giovannini Group was a group of financial market experts, formed in 1996 to advise the European Commission on financial market issues. In particular, the work of the Giovannini group focused on identifying inefficiencies in EU financial markets and proposing practical solutions to improve market integration.

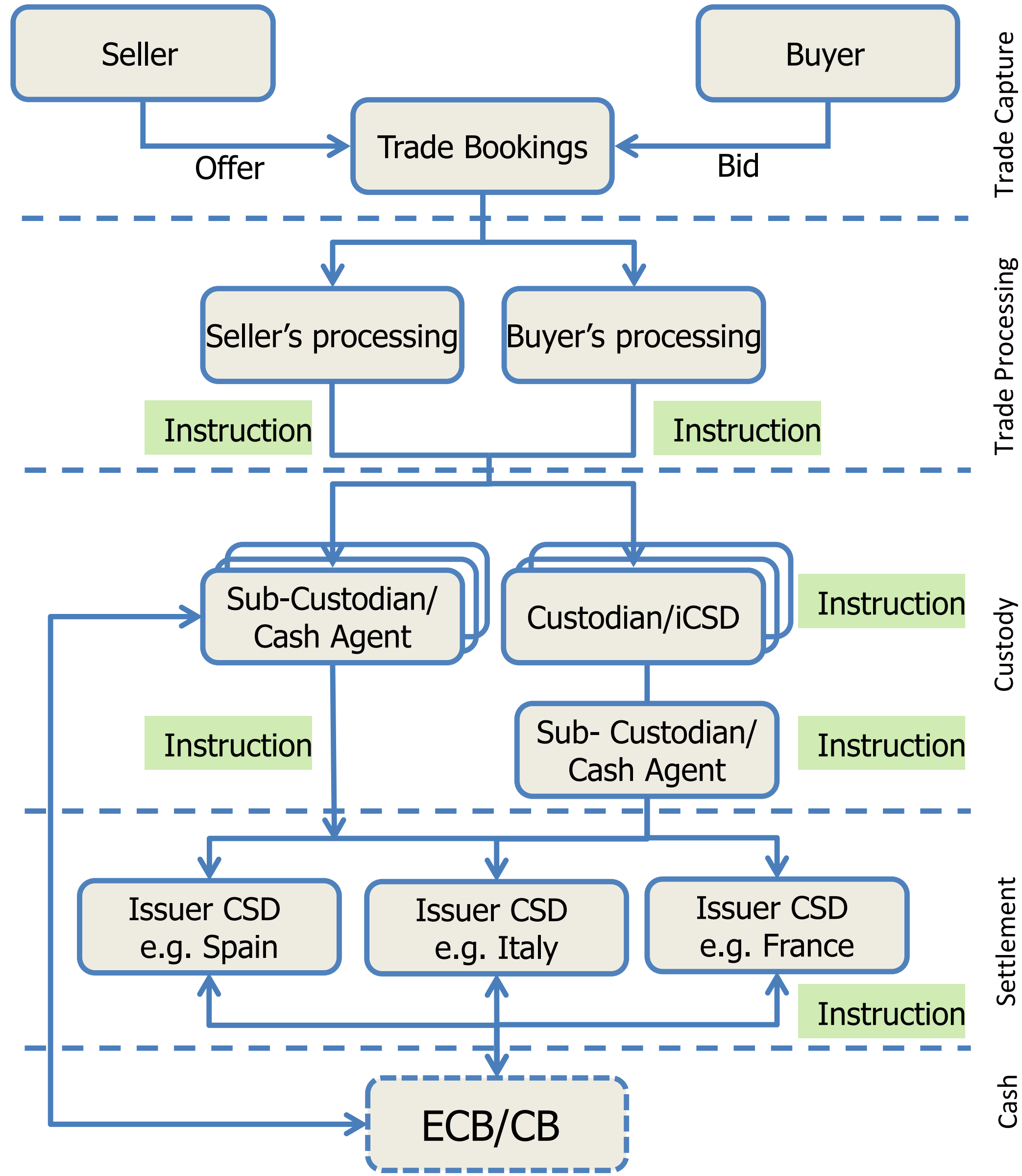
- The Group's two reports identified a total of **15 specific barriers** that prevent efficient EU cross-border clearing and settlement.

  - **National differences in information technology and interfaces**
  - **National clearing and settlement restrictions that require the use of multiple systems**
  - Differences in national rules relating to corporate actions, beneficial ownership and custody
  - **Absence of intra-day settlement finality**
  - **Practical impediments to remote access to national clearing and settlement systems**
  - National differences in:
    - ❖ **settlement periods**
    - ❖ **in operating hours/settlement deadlines**
    - ❖ in securities issuance practice
    - ❖ **restrictions on the location of securities**
    - ❖ restrictions on the activity of primary dealers and market makers
  - Domestic withholding tax regulations serving to disadvantage foreign intermediaries
  - Transaction taxes collected through a functionality integrated into a local settlement system
  - The absence of an EU-wide framework for the treatment of interests in securities
  - National differences in the legal treatment of bilateral netting for financial transactions
  - Uneven application of national conflict of law rules

European Post Trade processing pre T2S

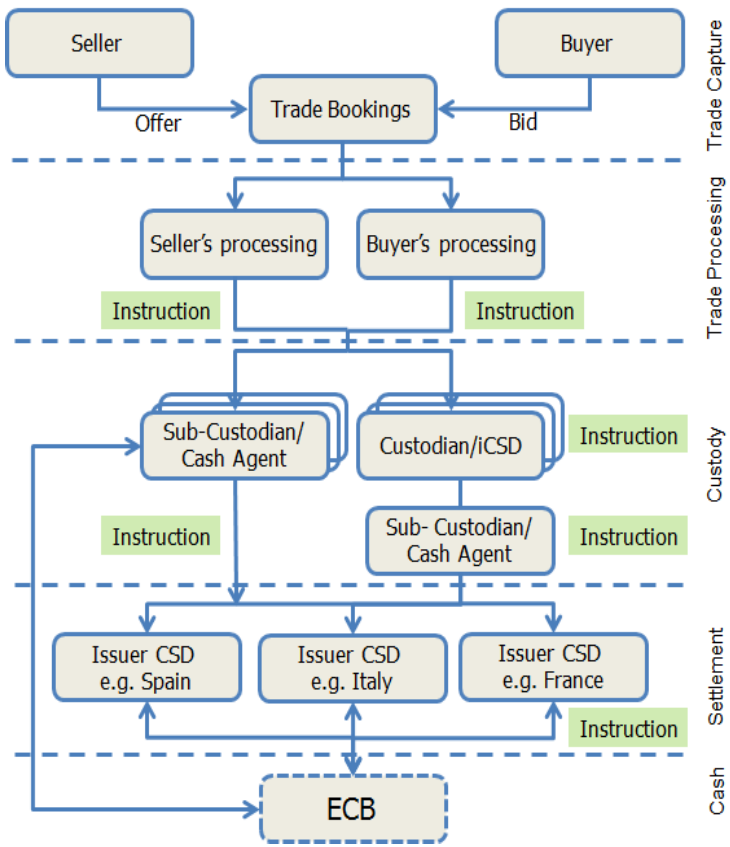
Post trade mechanics: Pre T2S example.

- Post trade, different message formats and timings for confirmation and affirmation exist
- Numerous instruction messaging may be required to facilitate settlement
- Connectivity to multiple CSDs required to support each issuer market
- Each market may have different settlement rules (cut-off/instruction type)
- Access to ECB money via each NCB, meaning connection needed to many domestic markets
- Multiple cash accounts result in liquidity constraints and inefficiencies- collateral is pledged in multiple NCBs
- Fragmentation of collateral inventory creating operational overheads – ICSD and Triparty developments outside of CeBM.

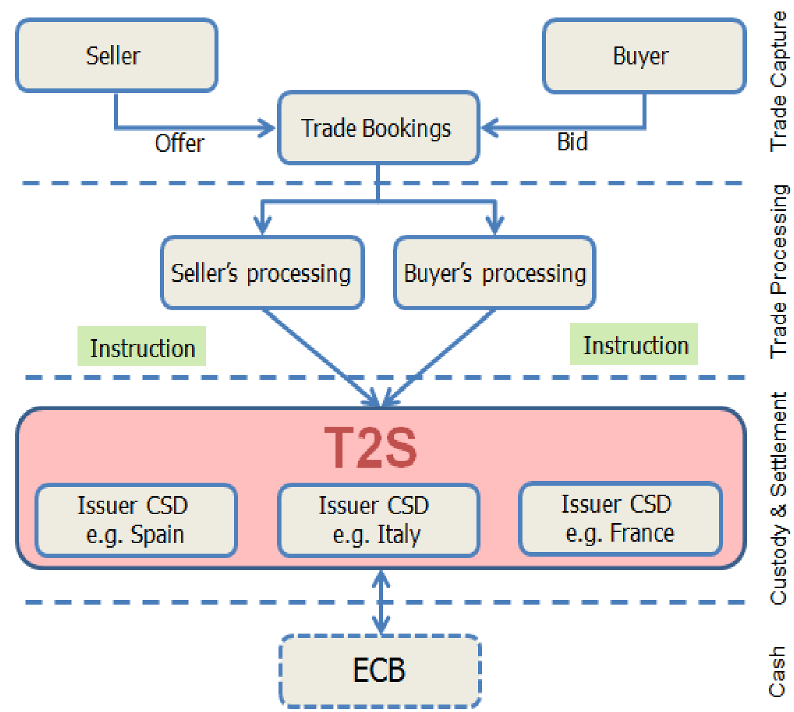


The operating & collateral model evolves

The "simple" cash trade in today's landscape can be complex…



… but will be much simpler post T2S – compression of processing in a harmonised environment



How T2S benefits liquidity – what's in the ECB settlement box?

A number of technical features reduce the size of intra day credit by firms & free up inventory and cash more efficiently:

- Settlement & balance sheet netting – o/n technical netting – matched pairs – multiple settlement models to generate optimal order of settlement to reduce movements of cash and inventory
- Partial settlement – 100k minimum market size(DVP)
- Self & Auto-collateralisation – cash, haircut, collateral
- Ear-marking & Blocking – trade prioritisation

Balance Sheet netting benefits – FIN41

Linking single or multiple security accounts to a single cash account allows netting at a cross CSD level in a single securities settlement system satisfies FIN41 & IRFS standards (a stricter definition).

What is FIN41 – a ruling under the Financial Accounting Standards Board which allows firms to us repurchase agreements under the following conditions to reduce balance sheet usage.

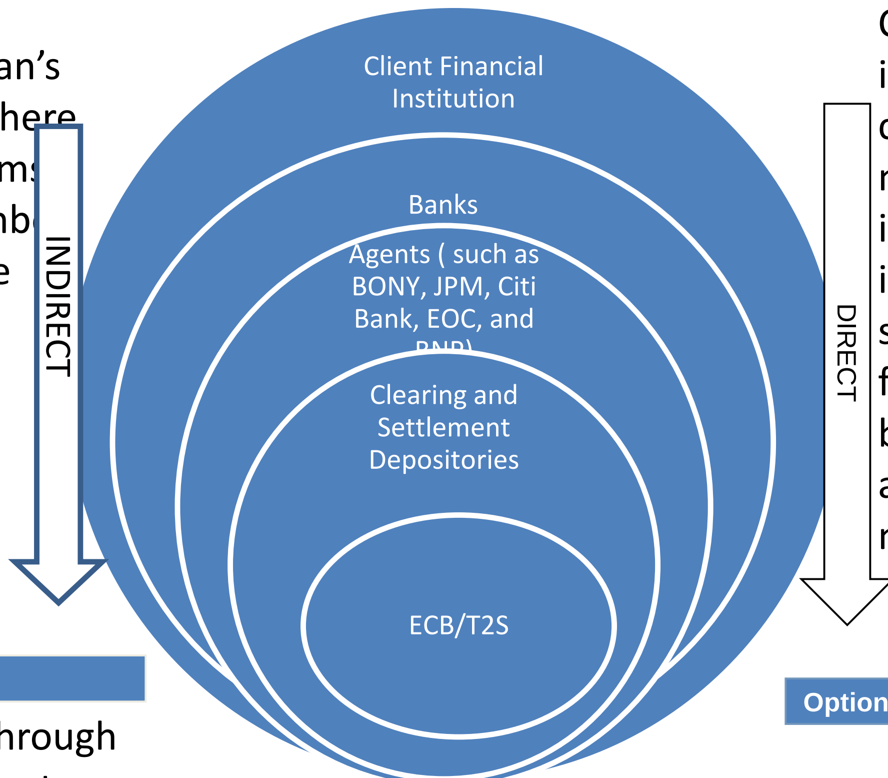
- Same c/p
- Value date is the same
- Direction of the trades offset
- Same ISIN
- In the same settlement system
  - T2S is regarded as a single settlement system where securities accounts are linked to the same cash account funding them
  - This would enable a firm to have for example accounts in Italy, France & Germany linked to the same funding account to bring all repo together into the same netting calculation.

- This reduces the trade flow to a net cash settlement between c/p's
- Run the trade processing at book entry level rather than gross settlement & delivery vs payment

Possible Options to connect to T2S

Option 2

Access T2S indirectly through a few Custodian's consolidated agents. There are signs that some firms are reducing their number of agents to streamline processing points



Option 3

Custodian to partially insource settlement, clearing and liquidity management. JPMorgan is progressively moving into this model with a sponsored access model for a number of its businesses to lower costs and increase velocity of movements.

Option 1

Access T2S indirectly through current Custodian's agent network. Most firms are accessing this route leaving wave migration landing to the agent and custodian change management

Option 4

Custodian to insource all agent services. Probably an aspirational model dependant on a transitional change through options 2 & 3

T2S Market Migration Waves

TARGET2-Securities Implementation Timeline				
JUNE 22, 2015	MARCH 28, 2016	SEPTEMBER 12, 2016	FEBRUARY 06, 2017	SEPTEMBER 18, 2017
WAVE 1	WAVE 2	WAVE 3	WAVE 4	WAVE 5
• Bank of Greece Securities Settlement System (BOGS) • Depozitarul Central (Romania) • Malta Stock Exchange • SIX SIS (Switzerland) • *Monte Titoli (Italy)*[2]	• Interbolsa (Portugal) • National Bank of Belgium Securities Settlement System (NBB-SSS)	• Euroclear Belgium • Euroclear France • Euroclear Nederland • VP LUX Luxembourg • VP Securities (Denmark)	• Clearstream Banking (Germany) • Centrálny depozitár cenných papierov (CDCP) (Slovakia) • KDD-Centralna Klirinško • KELER (Hungary) • LuxCSD (Luxembourg) • Oesterreichische Kontrollbank (Austria)	• Euroclear (Finland) • Eesti Väärtpaberikes-kus (Estonia) • Lietuvos centrinis vertybiniu popieri u depozitoriumas (Lithuania) • LCD - Latvijas Centralais depozitarijs (Latvia) • Iberclear (Spain)

2 *Italy's transition was delayed and subsequently was implemented as of August 31, 2015.*

The above implementation timeline takes into consideration changes agreed on by the T2S Central Securities Depository Steering Group for the migration of CSDs to the European settlement platform TARGET2-Securities (T2S). This was due to a delay of ESES joining the platform, and subsequently involved a re-plan of Waves 3 and 4, the creation of a 5th Wave, and Euroclear Finland moving into this last Wave.

N.B. The iCSDs; Euroclear Bank and Clearstream Bank Luxembourg are not part of T2S markets.

Triparty and T2S

- T2S will not in itself deliver a Triparty product. However service providers will be able to offer their own Triparty products within the markets they support, eg CSDs.
- ICSDs will continue to operate their current services, offering access to collateral takers through “as is” Triparty models.
- Those accessing T2S as direct participants will have ability transfer assets to ICSDs for use in ICSD Triparty trades and organise collateral pooling in T2S with agents and service providers.
- Harmonisation of settlement deadlines through T2S; Interoperability and “Open Inventory Sourcing” is resulting in greater optimization of collateral and therefore positively impacting Triparty.
- ECB is proposing to introduce a new European Collateral management system in the next 2-3 years with a Triparty product part of its design

What are the key benefits of settlement through T2S?

The main drivers for T2S:

- Reduce fragmented infrastructure – progressive alignment to investor CSD models
- Maximise settlement efficiency – netting, partial and reduced places of settlement
- Maximise collateral efficiency – self & auto-collateralisation
- Simplify and standardise market rules across European markets – T+2 settlemnt
- Reduce cost to market participants – less technical movement
- Increase settlement in Central Bank money – liquidity realignment
- Increase stability in the European Markets - transparency and control of the system

In short…. Remove as many Giovannini Barriers as possible standardising:

- The European technical infrastructure
- market participant interaction
- legal, tax and regulatory processes

What other benefits may evolve?

Reduction in the number of CSDs

- The current total cost of the 30+ CSDs in Europe must be borne by market participants
  - Too expensive to operate all the systems
  - Too much capital used to maintain the CSD's balance sheet
- For brokers, fund and investment managers, and insurance firms this can only mean reduced margins
- For investors, high costs to access the market can only mean lower returns. This could be improved in T2S
- Ie. Baltic compression to NASDAQ

Increase in investor choice for CSD of issuance

- Greater competition could lead to reduced cost to issue and list securities
- As issuer's see lower costs this could lead to higher yields for investors = increase in investors
- As investor base grows, an increase in confidence could create occur: creating a virtuous circle of investment

Increase in Foreign Direct investment in European markets

- Simpler technology, settlement mechanics and consistent tax and legal treatment could reduce the cost for investors outside of the Eurozone, driving inward investment to European markets

Distribution of investment throughout Europe

- With a reduction in CSDs offering economies of scale and reduced cost of market entry there could be an opportunity for "smaller" nations in the Eurozone to increase intra-Eurozone investor base

Easier SSI management = improved settlement efficiency = reduced costs

Addendum

Recommended background & reference reading

- Plumbers and Visionaries – Peter Norman (historical view of settlement and clearing in Europe – pre T2S)

- Securities Operations – Michael Simmons

- Collateral Securities and Operations, Repo, OTC Derivatives and the future of finance – Danny Corrigan / Natasha De-Teran.

Areas for consideration for T2S operating models (access & agent choice)

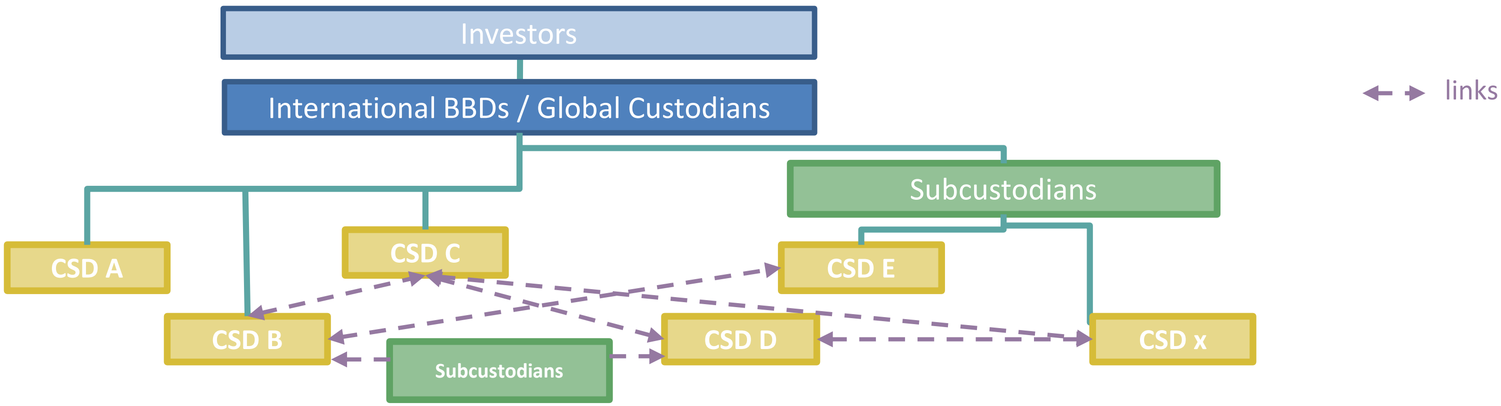
Area	Driver	Rationale	How to measure
Business/ Strategic	**T2S service capability**	create competitive advantage	- Efficient access to T2S - Ability to offer additional T2S services - Competitive/best deadlines - Low(est) cost per settlement - Ability to offer account operator services, ..
	Ability to address **new** client segments and **revenue**/protect existing business	Strategic growth	- Identify new opportunities (eg fail coverage, depot management, payment bank, ETF settlement...) -- timing (too late/too soon)
	Ability to pool collateral/ liquidity	Balance sheet +cost	- Identify service constraints +optimal model
Cost	Reduce fully loaded costs of **settlement** in T2S	Competitiveness	-Agent pricing exercise - Agent consolidation - include internal costs (build + running)
	Minimise **cost of liquidity** (intraday) +collateral in T2S	Balance sheet efficiencies	- Identify possibilities to net euro flows/CeBM - Compare with agent model - include internal costs (build +running)
	Minimise **ancillary costs** (asset servicing, communication etc)	Competitiveness	- Quantify additional costs (build + running)

Review & reference points for strategic change (access model/agent choice)

Area	Driver	Rationale	How to measure
Efficiency	Maintain/improve **STP** processing **levels**	Cost of settlement fails post CSD Reg, T+2 etc	- STP target - Review impact of changes (SSI/account changes, T+2 etc) - Identify new instruction types/procedures - manual procedures/ISO 15022 workarounds - Review impact of access models + resource needs
	Automate /improve **reporting** (internal/external)	STP +client service	-Timing of updates -Matching reports/allegements etc - Cash reporting
	Be in line **with T2S standards/**best market practices	Service quality	--ISO 20022 standards --exception processing
	Minimise **inefficiencies of X-border** settlement	STP+ client service	- CSD to ICSD realignments - Depot management - ETF settlement
Risk	Minimise **T2S project/change risk**	Cost	- Review risks +mitigating measures - Identify best rollout scenario
	Minimise **subcustodian risk**	Risk +regulations	- Review custodian model -Review contingency measures - review cash (redeposit) risk
	Optimise credit usage	Cost + risk Balance sheet	-Optimise credit usage from agents --Optimise use of collateral (own/clients)

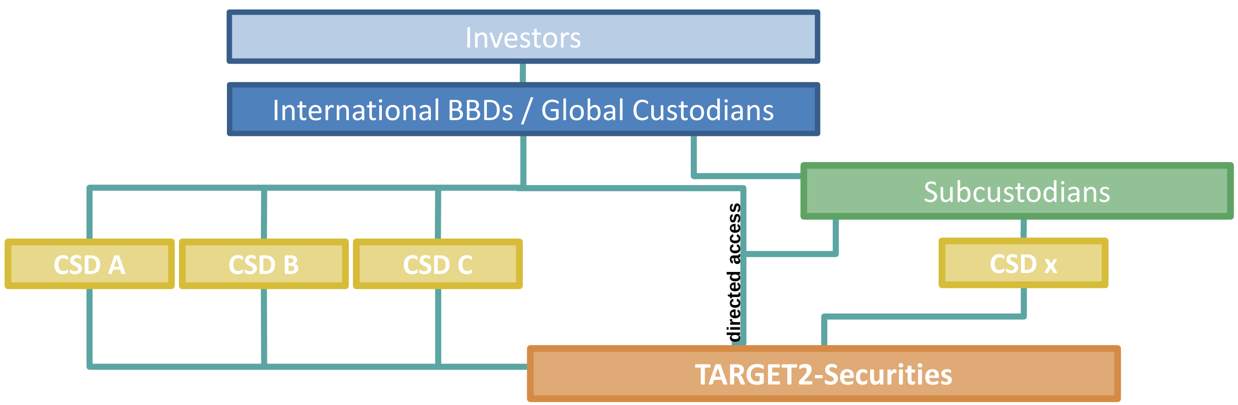
EU Settlement Landscape

The ***previous*** landscape of EU settlement



No integrated cross-border settlement process

The ***current*** landscape with T2S



One integrated settlement process (domestic and cross border)
One technical platform used by CSDs for securities settlement

Coffee break

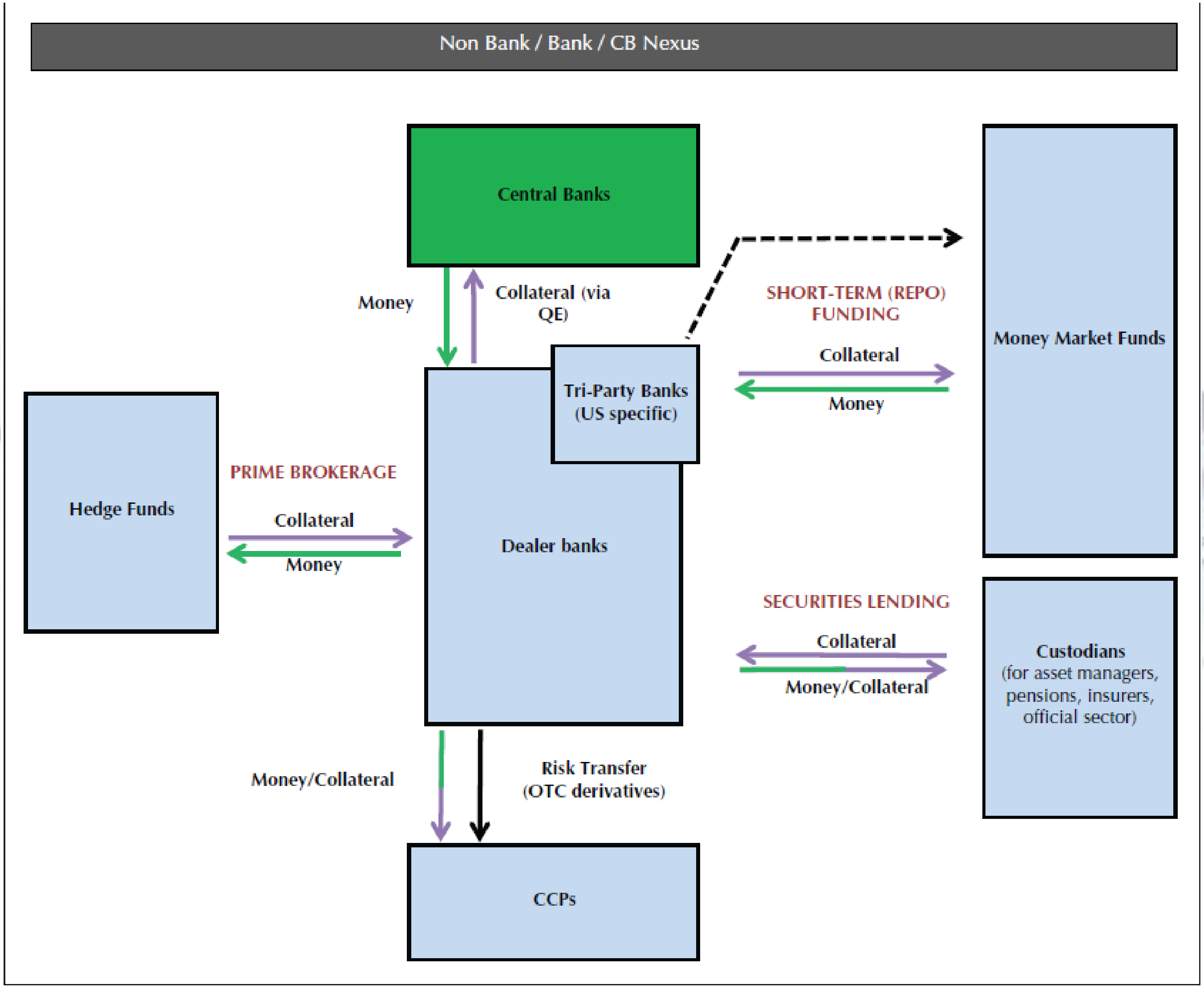
Peer-to-peer trading in repo

Stephen Malekian, Head of Business Development – US, Elixium

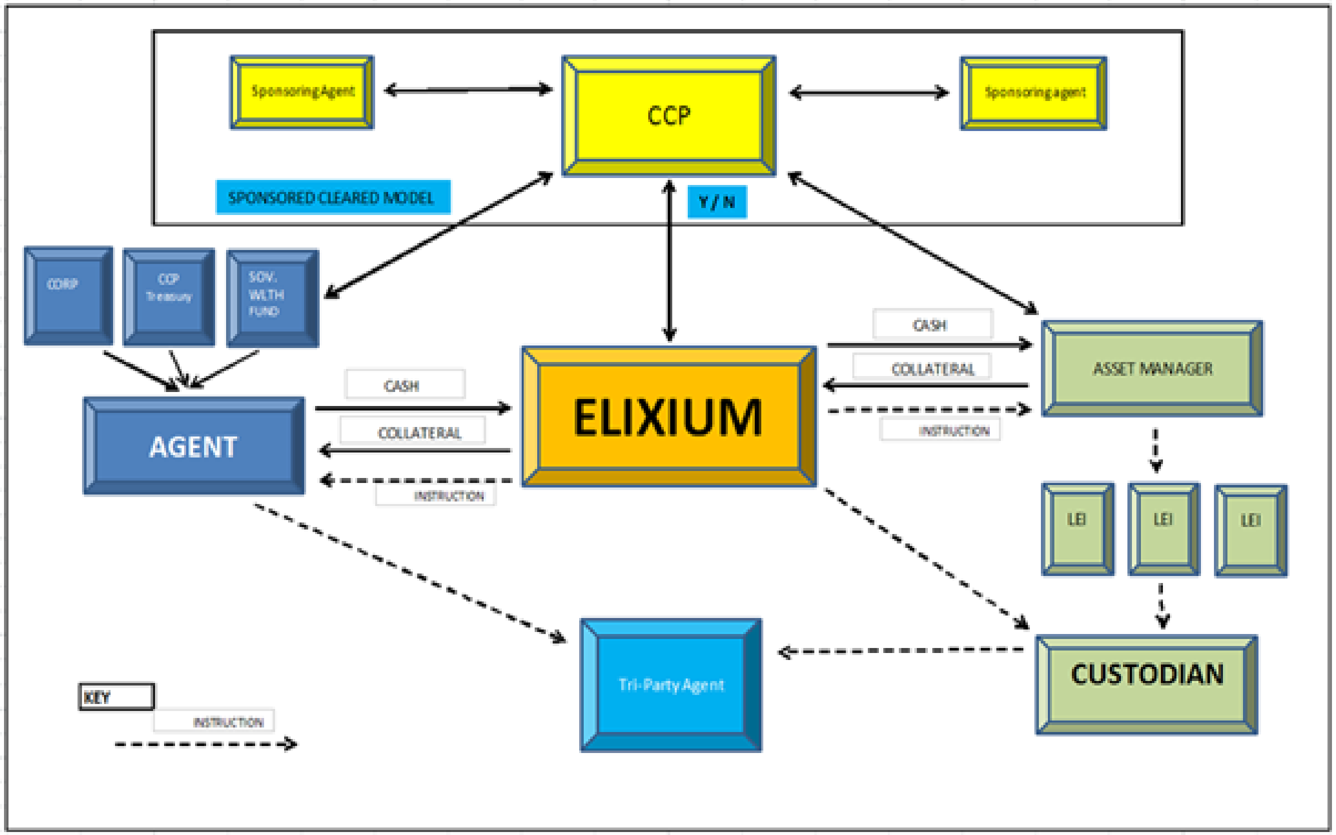
Stephen Malekian

Head of Business Development - US

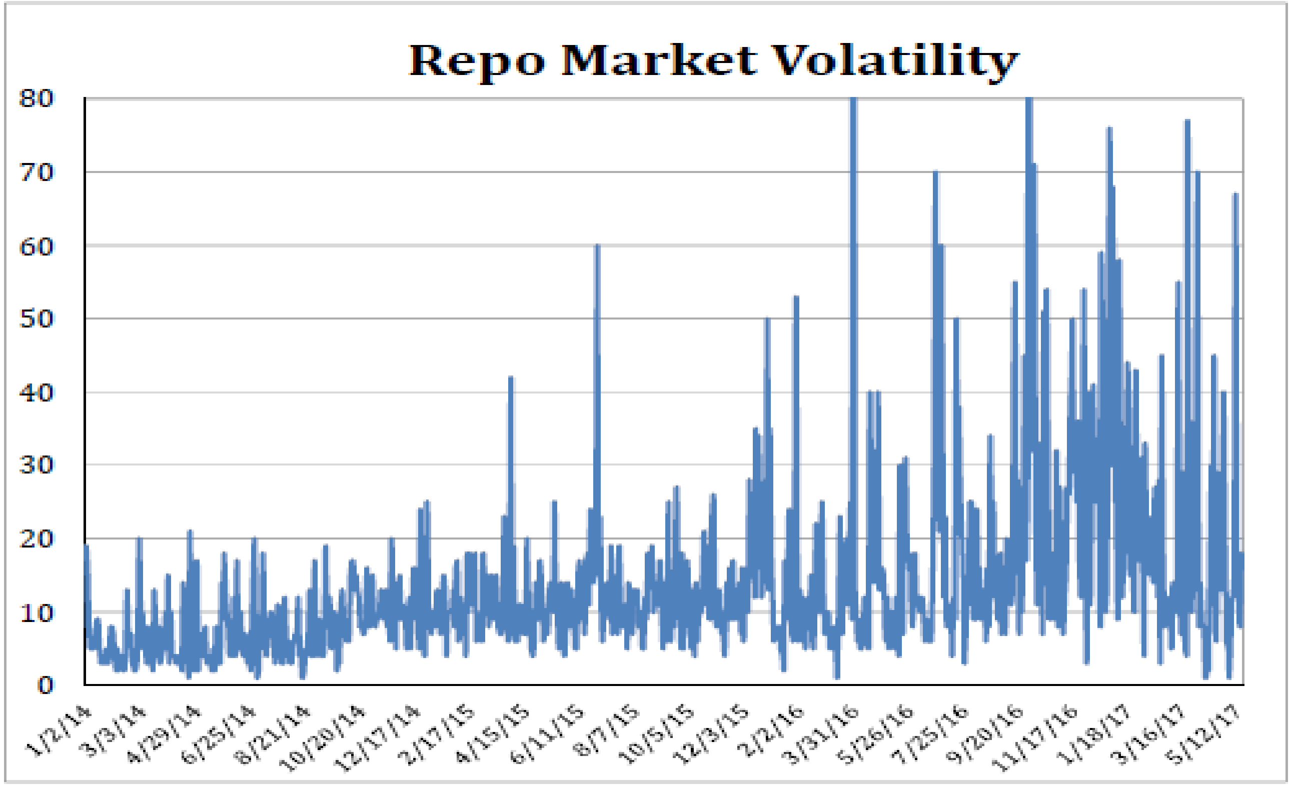
Stephen Malekian has over 35 years of experience in the global financing markets. Having run Global Fixed Income Finance and Prime Services at Citi and European and Asian Fixed Income Finance at Barclays, he brings a unique perspective to our product and client base. Consistently at the top of the Coalition performance rankings for the Fixed Income Finance business, he has been at the forefront of transitioning these businesses away from balance sheet intensive enterprises, to satisfying the ratios on capital, leverage and liquidity, to meet the return hurdles on a bank's cost of long term capital. To that end he has joined us to develop Elixium's All to All lending market place in Europe and roll out the business to the US. Steve has been Chairman of SIFMA's Executive Committee of their Funding Division, member of the New York Federal Reserve Task Force on Triparty Reform, as well as a member of the European Repo Council and the LCH Risk Committee.



Non Bank / Bank / CB Nexus
Central Banks
Money
Collateral (via QE)
Tri-Party Banks (US specific)
SHORT-TERM (REPO) FUNDING
Collateral
Money
Money Market Funds
Hedge Funds
PRIME BROKERAGE
Collateral
Money
Dealer banks
SECURITIES LENDING
Collateral
Money/Collateral
Custodians
(for asset managers, pensions, insurers, official sector)
Money/Collateral
Risk Transfer (OTC derivatives)
CCPs



Sponsoring Agent
CCP
Sponsoring agent
SPONSORED CLEARED MODEL
Y / N
CORP
CCP Treasury
SOV. WLTH FUND
AGENT
CASH
COLLATERAL
INSTRUCTION
ELIXIUM
CASH
COLLATERAL
INSTRUCTION
ASSET MANAGER
LEI
LEI
LEI
CUSTODIAN
Tri-Party Agent
KEY
INSTRUCTION


Repo Market Volatility
80
70
60
50
40
30
20
10
0
1/2/14
3/3/14
4/29/14
6/25/14
8/21/14
10/20/14
12/17/14
2/17/15
4/15/15
6/11/15
8/7/15
10/5/15
12/3/15
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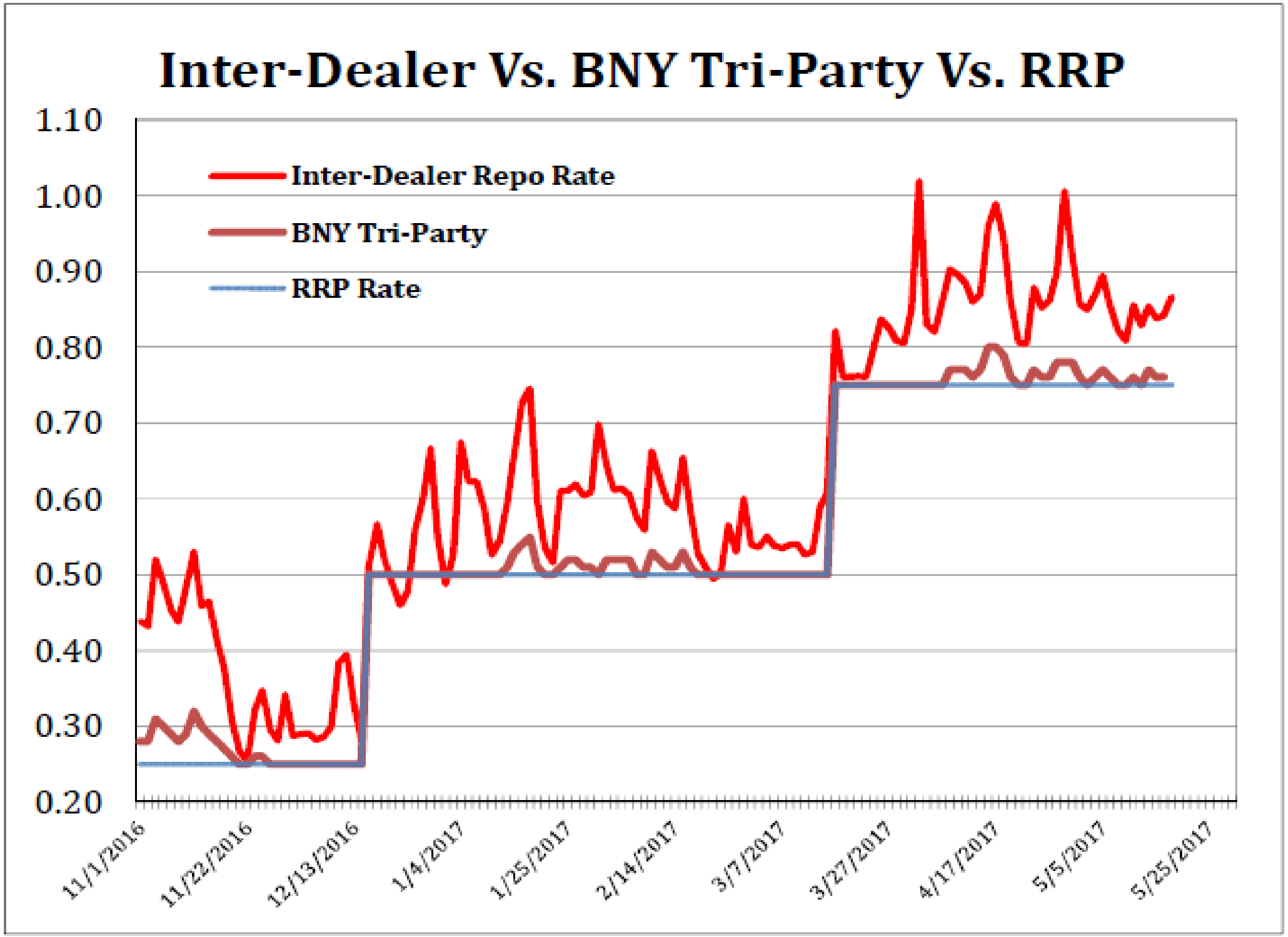
3/16/17
5/12/17


Inter-Dealer Vs. BNY Tri-Party Vs. RRP
Inter-Dealer Repo Rate
BNY Tri-Party
RRP Rate
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
11/1/2016
11/22/2016
12/13/2016
1/4/2017
1/25/2017
2/14/2017
3/7/2017
3/27/2017
4/17/2017
5/5/2017
5/25/2017

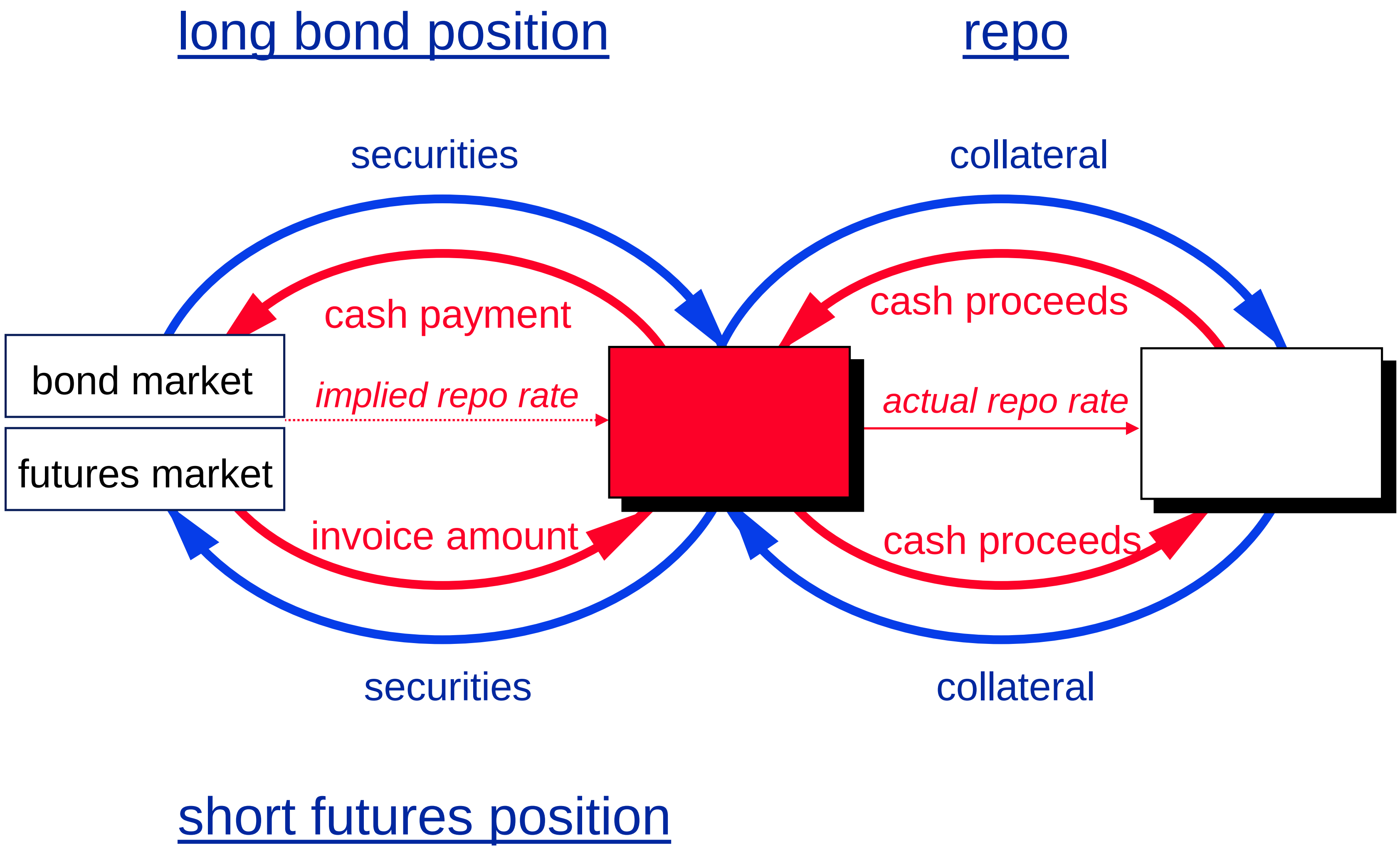
Why and how the buyside use repo

Moderator:	Richard Comotto, ICMA Centre at Reading University
Panellist:	Mick Chadwick, Head of Securities Finance, Aviva Investors
Panellist:	Emma Cooper, Director, EMEA Head of Repo, BlackRock
Panellist:	Paul Van de Moosdijk, PGGM

Conclusion

Richard Comotto, ICMA Centre at Reading University

basis trading



ICMA Workshop: Professional Repo and Collateral Management
1-2 June 2017