ERCC Professional Repo Market & Collateral Management

LCR & NSFR for Repo – October 2021 workshop

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Disclaimer

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Executive Summary - Liquidity Ratios

‘Repo’ plays a crucial role within the financial system.

Understanding the regulatory constraints is therefore key to understand financing products and activities.

Basel III post-crisis reform - Two liquidity standards

Following the failure of many banks to adequately measure, manage and control their liquidity risk in 2008 and in subsequent years, the **Basel Committee on Banking Supervision (BCBS)** introduced two liquidity standards as part of the Basel III post-crisis reforms:

- ✓ The first of these is the **Liquidity Coverage Ratio (LCR)** which enhances banks' short-term resilience
- ✓ The second is the **Net Stable Funding Ratio (NSFR)** which aims to promote resilience over a longer time horizon by creating incentives for banks to fund their activities with more stable sources of funding

Already in place and impacting globally the financing markets

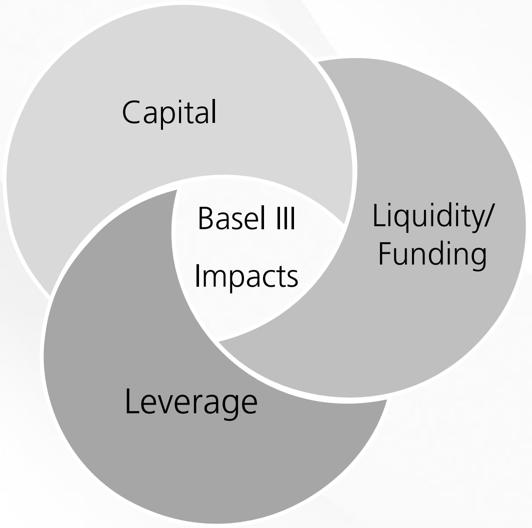
- LCR became a requirement on 1 January 2015, set at 60%, up to 100% on 1 January 2019 for large banks (>$250bn assets and >$10bn on-balance-sheet foreign exposure)
- NSFR became effective this year as of 1 July 2021
- **Both LCR and NSFR have had impacts on ways banks are sourcing or deploying liquidity**

Agenda today

1. What are the LCR & NSFR?
2. How are they calculated?
3. What could be possible impacts for banks
4. Case studies based on the Basel III framework publications

Regulation Overview: a more resilient banking sector

Regulations have changed dynamics of Balance-Sheet & Capital and require Banks to optimise their businesses



Basel III - Summary

- **Capital Requirements** - increased capital requirements for large (GSIB) banks. Introduction of gone concern capital.
- **Enhanced Risk Framework** enhanced rule set to capture credit, market and operational risk, including greater constraints on the use of models.
- **Large Exposure Framework** rules limit risk exposures to counterparties in order to mitigate systemic risk concentrations arising from interlinkages across financial institutions
- **Leverage Ratio** ensures that Tier 1 Capital is 3% of Leverage exposure (total assets and certain off balance sheet items). G-SIB banks have to meet a minimum of 5%
- **Liquidity Coverage Ratio** (2015-2019) ensures that banks maintain an adequate level of liquid assets to survive a 30-calendar day acute stress scenario
- **UMR Phase 5 & 6** - final phase of UMR requires both counterparties to swap contract to exchange initial margin subject to materiality thresholds
- **The Net Stable Funding Ratio** (2021) designed to influence the structure of funding by creating incentives for banks to fund assets not readily saleable with stable funding

Regulatory outlook

Basel 4 – (2022) Basel's upgraded capital framework enhancements to the rules, significantly raising the bar on capital, risk frameworks and, leverage ratio

Section 1

LCR – Liquidity Coverage Ratio

What is LCR?

Background:

- LCR is **set by the Basel Committee** for Banking Supervision created as part of the **Basel III post-crisis reform**

When and why has it been introduced:

- **Before 2007 crisis**, Banks were inclined to expand their B/S by **relying on relatively cheap and abundant short term funding.**
- The LCR is designed to ensure that banks hold **a sufficient reserve of liquid assets to survive a short term liquidity stress** over a period of 30 calendar days.
- Short term stress means: firm-specific, broader industry or market liquidity stress events
- Published in **January 2013** and reviewed as of 15 December 2019
- Implemented fully as of **1 January 2019**

Where does it apply:

- LCR is an **international standard** which applies globally
- **Each region/jurisdiction have implemented their own version** so there are differences in term of content and timing
- **Some banks have more stringent definitions than others**

LCR Calculation

LCR*

LCR: Liquidity Coverage requires banks to hold a stock of HQLA at least as large as expected total net cash outflows over the stress period

$$\frac{\textbf{Stock of High-Quality Liquid Assets (HQLA)}}{\textbf{Net cash outflows over the next 30 calendar days}} \geq \textbf{100\%}$$

This ratio should be equal to **at least 100%**, on an ongoing basis

HQLA: HQLA are cash or assets that can be converted into cash easily through liquidation without significant loss of value. There are 3 levels of HQLA: Level 1, Level 2a and Level 2b

Cash outflows: total expected cash outflows minus total expected cash inflows in the specified stress scenario for the subsequent 30 calendar days**.** Please note that a 75% cap on outflows is applied to the inflows calculation
= expected cash outflows – min (expected inflows; 75% of expected outflows)

*At end-June 2020, EU banks' average LCR stood at 166% and no bank reported LCR levels below 100%***

*Source: https://www.bis.org/basel_framework/chapter/LCR/40.htm
**Source: https://www.eba.europa.eu/eba-updates-its-report-liquidity-measures-and-confirms-banks%E2%80%99-solid-liquidity-position

LCR numerator: High Quality Liquid Assets (HQLA)

HQLA can be both **easily and immediately converted into cash** at little or no loss in value in case of market turbulence, ideally central bank eligible.

All assets in the stock must be **unencumbered and operationally monetizable**

*Each regulator institution can apply a more stringent definition

Level 1 assets	HC
Cash & Central Bank Reserves	0%
Domestic sovereign or central bank debt for non 0% risk-weighted sovereigns (e.g., Bund, OAT, UST, Gilt, Swiss Govt)	
Liquid Marketable securities assigned a 0% risk weight	
Level 2A assets (maximum 40% of HQLA pool)	**HC**
Marketable securities issued by sovereigns, central banks, Public Sector Entities and MDBs assigned a 20% risk weight	15%
Non financial corporate debt securities rated AA- or higher	
Covered bonds rated AA- or higher	
Level 2B assets (maximum 15% of HQLA pool)	**HC**
RMBS (rated AA and higher), Corporate Debt (non-financial, rated A+ to BBB-)	25%
Equity shares (non-financials, exchange traded, major index)	50%
All Others	**HC**
Corporate Debt (below BBB-) and all Financials bonds, even investment grade	100%

Stock of HQLA = Level 1 + Level 2a + Level 2b – adjustment for 15% cap – adjustment for 40% cap

Case Studies: comparing HQLA types

Product covered

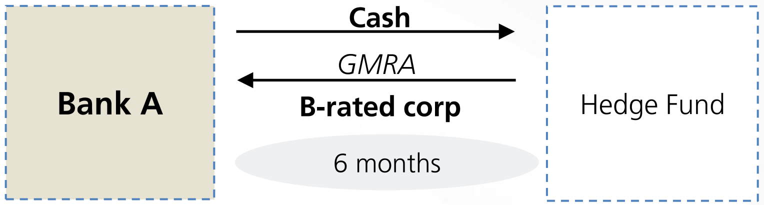
Repo, financing swap

Collateral exchange

Case 1 - Reverse repo

Trade: Reverse repo under GMRA
Collateral: B-rated corporate bonds **= non-HQLA**
Tenor: 6-months
Counterparty: Hedge Fund
Bank A is downgrading its LCR for 5 months

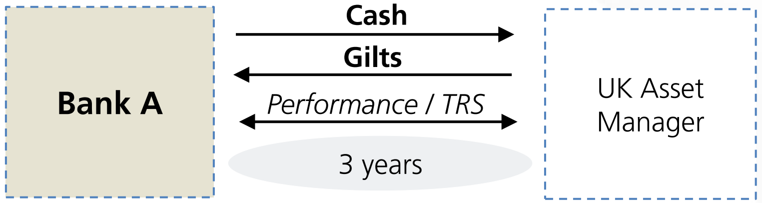
Diagram



Case 2 – Financing TRS

Trade: Financing TRS under ISDA/CSA
Collateral: benchmark GC Gilt **= L1 HQLA**
Tenor: 3-years
Counterparty: UK Asset Manager
No impact on Bank A's LCR for the whole duration

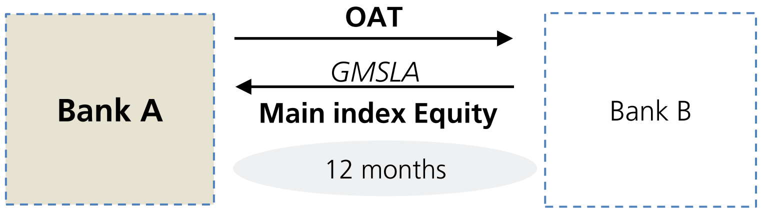
Diagram



Case 3 – Collateral downgrade

Trade: Collateral exchange under GMSLA
Loaned Securities: OAT = **Level 1 HQLA**
Collateral: GC equity from tradable index **= L2B HQLA**
Tenor: 12-months
Counterparty: Bank
Bank A is downgrading its LCR by 50% for 11-months

Diagram



Did you know?

LCR is agnostic when it comes to trade formats: repo, securities lending, on- or off-balance sheet derivatives

Case Studies: evergreen and extendible tenors

Product covered

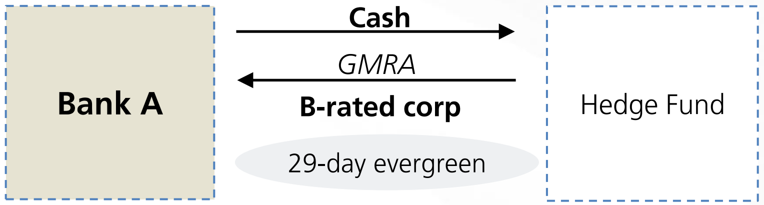
Repo

Collateral exchanges

Case 4 - Reverse repo < 31-days

Trade: Reverse repo under GMRA
Collateral: B-rated corporate bonds **= non-HQLA**
Tenor: **29-day evergreen**
Counterparty: Hedge Fund
Cash outflow but inflow within 31-days
No impact on Bank A's LCR for the whole duration

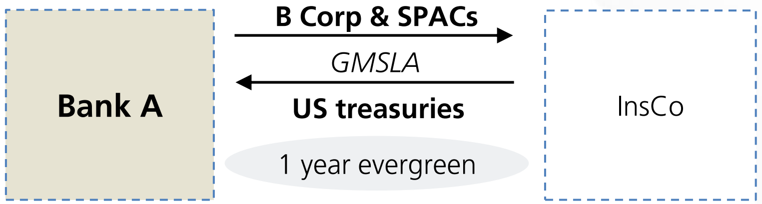
Diagram



Case 5 – Collateral upgrade

Trade: Collateral exchange under GMSLA
Loaned Securities: US Treasuries = **HQLA Level 1**
Collateral: B-rated corporate & SPACs **= non-HQLA**
Tenor: **1 year evergreen**
Counterparty: Insurance Company
Bank A is upgrading LCR up until the trade evergreen feature is called, then LCR benefit will remain for 11 months

Diagram

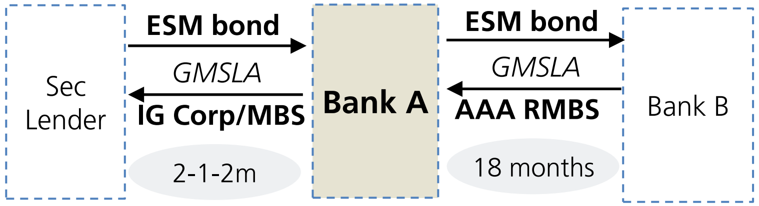


Did you know?

Case 6 – back-to-back Collateral exchanges

Trade: up and-downgrades under GMSLA
Bank A sources from Sec Lender a ESM bond for 10 bps vs Triparty IG set (incl. Corp/MBS) and lend to Bank B for 50 bps
Loaned Securities: EUR denominated ESM bond (**L1 HQLA**)
Collateral: AAA EUR RMBS, ECB eligible **= L2B HQLA**
Tenor: **18 months versus 2-1-2-month extendible**
No impact on Bank A's LCR as long as the 2-1-2 trade is mutually extended monthly

Diagram



The implementation of LCR has led to the increase in extendible and evergreen tenors on the street

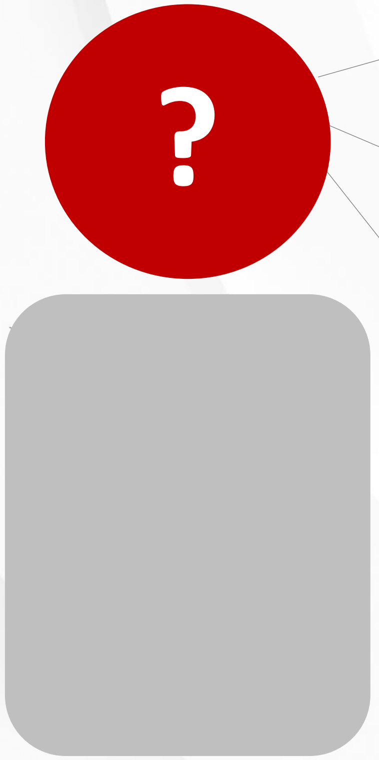
In a 29-day evergreen tenor: the trade will extend automatically every day by 1 more day (calendar), or equivalently, both parties can call the trade with 29 calendar day-notice

In a 2-1-2-month extendible tenor: parties can mutually agree to extend the trade every month by 1 more month (calendar). If not extended, the trade will terminate at its original tenor (eg. in one month)

Section 2

NSFR – Net Stable Funding Ratio

What is NSFR?



Background:

- NSFR is **set by the Basel Committee** for Banking Supervision created as part of the **Basel III post-crisis reform**

Why and when has it been introduced:

- **Before 2007 crisis**, Banks were inclined to expand their B/S by **relying on relatively cheap and abundant short term funding.**
- The aim of **NSFR is to limit excessive reliance of Banking system to short and unstable funding sources**.
- Published in **October 2014** and reviewed as of 15 December 2019
- Implemented fully as of **1 July 2021**

Where will it apply:

- NSFR is an **international standard** which applies in globally
- **Each region/country have implemented their own version** so there are differences in term of content and timing
- For instance: The EU implemented the NSFR via the Capital Requirements Regulation II, which was published in the EU Official Journal on 7 June, 2019. CRR II entered into force on 27 June 2019 and NSFR became binding on 27 June 2021

NSFR Calculation

NSFR

NSFR: Net Stable Funding Ratio is defined as the available stable funding relative to the amount of required stable funding.

$$\frac{\textbf{Available Stable Funding (ASF)}}{\textbf{Required Stable Funding (RSF)}} \geq \textbf{100\%}$$

This ratio should be equal to **at least 100%,** on an ongoing basis
NSFR is balance-sheet/LRD driven: trades with IFRS on-B/S exposures will likely have a NSFR impact

ASF: portion of **capital & liabilities expected to be reliable** over time horizon, which extends to 1-year

RSF: amount of stable funding required and is a function of liquidity characteristics and residual maturities of the various assets held as well as those of its off-balance sheet exposures

The **NSFR uses a balance sheet approach** to calculate '*available stable funding*', which must be at least equal to or greater than '*required stable funding*'

Available Stable Funding (ASF)

ASF measures the stability of an institution's funding sources

Think Bank's "Liabilities": who Bank borrows from?

ASF	• ASF is split into **5 categories** at which each **applies a factor** • Each category is linked to **maturity** and the **probability of the funding provider to withdraw their funding** • **Total ASF = Sum of each category multiplied by the applicable factor**

ASF Factors	**100%**	**95%**	**90%**	**50%**	**0%**

Capital & Liabilities
Long Tenor
High Stability

Capital & Liabilities
Short Tenor
Low Stability

ASF: what will matter most ?

1. **Funding Tenor:** Longer term liabilities considered more stable than short-term liabilities, favouring funding tenors above 1 year.
2. **Funding Counterparty**: Funding provided by certain counterparty considered more stable (Corporates more stable than Banks)
3. **Asset Quality & Liquidity**: Good quality assets do not need to be wholly financed with stable funding

Available Stable Funding (ASF)

ASF will vary with maturity and bank funding providers

Key notes:

- **Collateral upgrade / GMSLA** (eg Bank sources HQLA vs Equity) does not create a new liability, off-B/S) so **will not create any ASF**
- **Open repo:** 0% ASF
- NSFR led to change in market eg. with more frequent **Callable debt issuances (eg. 4NC3 FRNs)** from Financial Institutions or increased concentration in **retail deposits** (although often an expensive solution)

Factor	Residual tenor	Bank get funding from:	Liability type / Balance-sheet items	
100%	All	n.a	Capital	Regulatory Capital (excluding Tier 2 instruments <1y) Capital instruments above >1y
	Above 1y	**Any counterparty**	Funding	Liability with maturity >=1 year **(eg. Repo > 1y)** **(eg. Financial debt 4y callable when residual tenor <1y)**
95%	Below 1y	Small Business & Retail customers	Deposit	Term deposits
90%	Below 1y			Less stable non-maturity deposit
50%	**Below 1y**	Sovereign Public sector entity "PSE" Multilat and National Devt Banks **Non-Financial Corporate**	Funding	Liability with maturity <1 year **(eg. 95-day Repo with PSE or deposit from Corp)**
	6 months to 1-year	Central Bank Financial Institutions (**Bank**, AM/HF, InsCo, Pension, Financial Corp…)	Funding	Liability with maturity 6m to 1 year **(eg. 6-month evergreen Repo with Bank)**
0%	Other	Any counterparty	Funding	Other Liability not mentioned above or with no maturity **(eg. 1 week repo with Hedge Fund or Open repos)**
	All	Any counterparty	Derivatives	**Derivatives MTM will not create any ASF** if net Liability > 0

Required Stable Funding (RSF)

RSF is the amount of **stable funding required to cover its on & off-B/S assets**

Think Bank's "Assets": what does Bank invest into? Who Bank lends to?

RSF

- The RSF is split into **8 categories** at which each applies a factor
- Each RSF factor intend to approximate the amount level of funding needed to **assuming an LT asset won't easily be refinanced > 1year** without a cost.
- Each category is linked to the transaction residual **maturity** and **liquidity value of the collateral. The counterparty type** should also be taken into account to determine the RSF factor
- Total RSF = **Sum of each category x by the applicable factor + the off B/S activity x applicable factor**

RSF Factors	0%	5%	10%	15%	50%	65%	85%	100%

Capital & Liabilities
High Liquidity

Capital & Liabilities
Low Liquidity

RSF: what will matter most ?

1. **Funding Tenor:** Longer term assets will be detrimental, avoiding funding tenors above 1 year, and even 6-months to some extent
2. **Borrower Counterparty**: lending to Financials will require less stable funding than lending to a Sovereign or PSE
3. **Asset invested into and if encumbered**

Required Stable Funding (RSF)

RSF will vary with **maturity, investment and borrowers** as well as **encumbrance of assets** invested into

Key notes:

- **asymmetry between regulators:** impacting repo and cash trading (example of Open repo or Government bond repo and cash investment)
- **asymmetry between Public/Govt and FI:** lending 3-month to a PSE will require more stable funding than the same with Bank/Hedge Fund
- **any lending above 1y will use 100% of RSF** whereas it is a repo versus Govie, IG, HY or CLO

EU/ US**	CH/ Basel	Resid. tenor	Asset / Balance sheet item	with Counterparty	Example trade
	0%	n.a	Cash	n.a	Cash holding
		Below 6m	Reserves and claims	Central Banks	3-month Reverse repo vs UST with SNB
0%	5%	All	Unencumbered HQLA Level 1	All	Outright Purchase of OAT
0-5%	10%	Below 6m	Unencumbered loan vs HQLA 1 (rehyp)	Fin Institutions	3-month Reverse repo vs UST with HF
5%	15%	All	Unencumbered HQLA Level 2A	All	Outright Purchase of 2A Covered bond
		Below 6m	Unencumbered loan vs other assets	**Financial Institution**	**3-month Reverse repo vs Corp with Bank**
	50%	All	Unencumbered HQLA Level 2B	All	Outright Purchase of 2B Equity or RMBS
		[6m;1y[	Encumbered HQLA	All	Purchase of a OAT and lending it in 6m repo
		[6m;1y[	Loan	To Fin Institution or CBs	6-month Reverse repo on EM with AM
		Below 1y	Other assets/Loans	To Non-Fin Corporate, Retail, Sov, **PSE**	**3-month Reverse repo on Corp with PSE**
	65%	Above 1y	Unencumbered Resi Mtge RW* <=35%	All	Purchase of portfolio of eligible Resi Mtges
		Above 1y	Unencumbered Loans with RW <= 35%	All excl. Fin Institution	
	85%		Initial Margin / Cash to the CCP		Derivatives **IM** / CCP default fund
		Above 1y	Unencumbered Loans RW > 35%	All excl. Fin Institution	
		Above 1y	Unencumbered Non-HQLA assets, exchange traded Equity, Physical Commodities	All	Purchase of HY Corp or non HQLA Equity
	100%	Above 1y	Encumbered Assets	All	Purchase OAT and lend it for 3y
		Above 1y	NPLs, Other Loans/Assets not incl. above, non exchange traded equity	All	**3y reverse repo on Gilt with Bank** **Open repo** subj to jurisdiction
			Net MTM of Derivatives (if Asset > Liab)		**Net VM posting create 100% RSF**
			20% of Derivatives liability calculated as Replacement Cost		where derivatives has <0 value

*RW = Risk Weight under standardised approach

**EU/US implementation is different at least until 2025

NSFR summary

Banks constrained by NSFR would have to **move to longer term funding** (e.g. >6m) potentially affecting demand in short dated money markets

Asymmetries will lead to banks **choosing the combination of counterparty type and residual maturities** which best fits the NSFR construct

…and might lead to spread dislocation in repo market and other financing activities depending on each bank's internal cost or premium for NSFR usage

- If you lend 3-month cash to Bank and you hedge with 1 month borrow from a Corporate -> you can create NSFR
- If you lend 3-month to a HF and you hedge with a 3-month borrow from a bank –> you will degrade your NSFR

Residual Maturity /	**< 6m**		**[6m ; 1y[**		**> 1y**	
Counterparty Type	**ASF**	**RSF**	**ASF**	**RSF**	**ASF**	**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%
Banks / Fin. Institution	0%	10% /15%	50%	50%	100%	100%
Retail / Small Business	0%	50%	50%	50%	100%	65%/ 85%

Optimal combinations

Tenor	**Factor**	**ASF – borrow $ from:**	**Factor**	**RSF – deploy $ to:**
<6m	**[50%]**	Sov, PSE, Non-Fin Corporate	**[0%]**	Central Bank (CB)
	[0%]	CB, Banks, Other Fin, Retail	**[10%/15%]**	Banks, Other Fin
[6m;1y[	**[0%]**	CB, Banks, Other Fin, Retail	**[50%]**	Sov, PSE*, Non-Fin Corpo
	[50%]	All	**[50%]**	All
>=1y	**[100%]**	All	**[65%/85%]**	Sov, PFE, Non-Fin Corpo, Retail
			[100%]	Banks, Other Fin

Case Studies: comparing counterparties & collateral

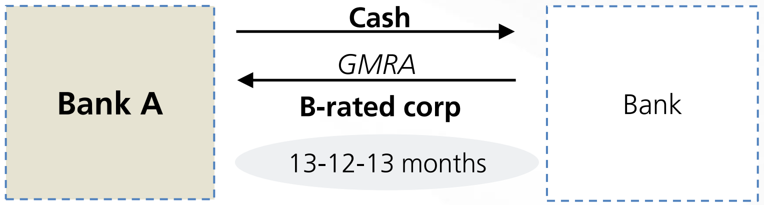
Product covered

Repo

Case 1 - Reverse repo on non-HQLA

Trade: Reverse repo under GMRA
Collateral: B-rated corporate bonds **= non-HQLA**
Tenor: **13-12-13-month extendible**
Counterparty: Bank/Financial Institution
RSF = 100% (>1y lending to financial institution)
Bank A will need to source 100% ASF to avoid NSFR drag

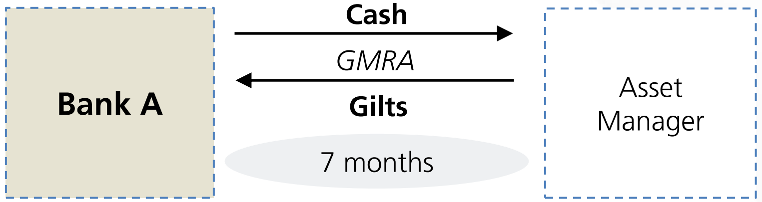
Diagram



Case 2 – Reverse repo on HQLA 1

Trade: Reverse repo under GMRA
Collateral: Benchmark Gilts = **HQLA Level 1**
Tenor**: 7 months**
Counterparty: Asset Manager
RSF = 50% (6m-1y lending to financial institution)
Bank A will need to source 50% ASF to avoid NSFR drag

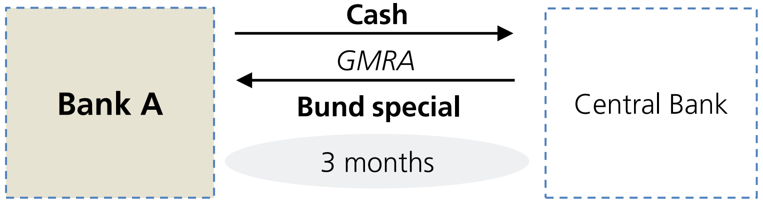
Diagram



Case 3 – Reverse repo with Central Bank

Trade: Reverse repo under GMRA
Collateral: AAA EUR RMBS, EGB eligible **= HQLA Level 1**
Tenor: **3 months**
Counterparty: Central Bank
RSF = 0% (claims to central banks with maturity < 6months)
No impact on Bank A's NSFR

Diagram



Did you know?

In May 2021, Eurex launched NSFR efficient Evergreen repo products (185d and 370d) to help banks better meet their stable funding requirements*

NSFR is asymmetric in terms of jurisdictions and type of counterparty Bank faces.

NSFR does not recognize the same value to HQLA L1 as LCR.

*Source: Eurex Briefing Note 01/2021

Case Studies: LRD friendly transactions

Product covered

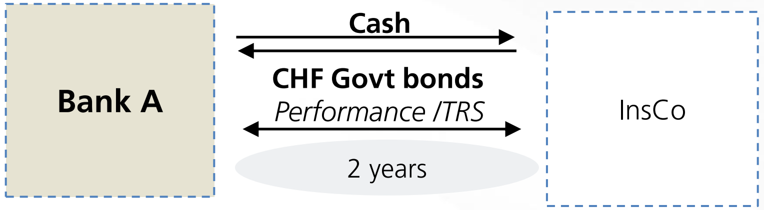
Collateral exchange

Derivatives

Case 4 – Financing TRS

Trade: Financing TRS under ISDA/CSA
Reference Obligation: CHF Swiss Government Bonds
Tenor: **2-years**
Counterparty: Insurance Company
RSF = 100% (trade requalified in reverse repo > 1y to Financials)
Bank A will need to source 100% ASF to avoid NSFR drag

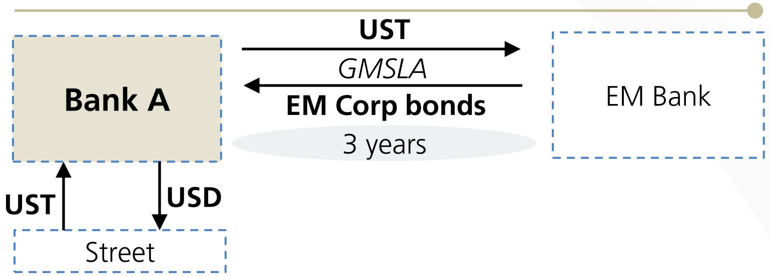
Diagram



Case 5 – Outright purchase & collateral downgrade

Trade: **Bank A buy a 5y-UST outright and re-use it in collateral downgrade** for yield enhancement under GMSLA
Collateral: UST, then onward lent vs Emerging Market Corps
Tenor**: 3 years**
Counterparty: EM Bank
RSF = 100% (trade encumbers UST for more than 1y)
Bank A will need to source 100% ASF to avoid NSFR drag

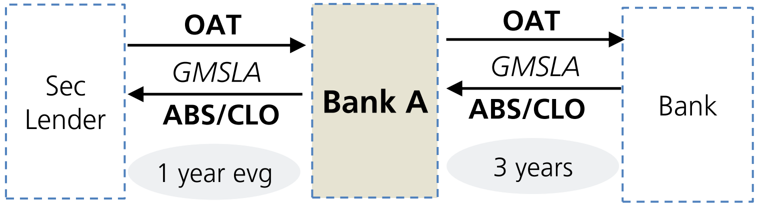
Diagram



Case 6 – back-to-back collateral exchanges

Trade: up and-downgrades under GMSLA
Loaned Securities: OAT
Collateral: Mix of ABS and CLOs
Tenor: **3 year versus 1 year evergreen**
No impact on Bank A's NSFR (off-B/S transaction under IFRS)

Diagram



Did you know?

NSFR is driven by the "IFRS" balance-sheet: LRD-friendly transactions will be mores lightly impacted by NSFR

A fully off-B/S TRS would only attract NSFR on its MTM

UBS

Useful public information

ICMA ERCC "Impacts of the Net Stable Funding Ratio on Repo and Collateral Markets"
- https://www.icmagroup.org

BIS website - NSFR & LCR relevant BCBS publications
- https://www.bis.org/basel_framework/standard/LCR.htm
- https://www.bis.org/basel_framework/standard/NSF.htm

EBA publications
- https://www.eba.europa.eu/regulation-and-policy/implementing-basel-iii-europe

FINMA publications (Circular 2015/02)
- https://www.finma.ch/en/documents/

Federal Reserve & Office of the Comptroller of the Currency websites
- https://www.federalreserve.gov/supervisionreg/basel/basel-default.htm
- https://www.occ.gov/topics/supervision-and-examination/capital-markets/balance-sheet-management/liquidity/liquidity-coverage-ratio-final-rule.html
- https://www.occ.gov/news-issuances/bulletins/2021/bulletin-2021-9.html

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