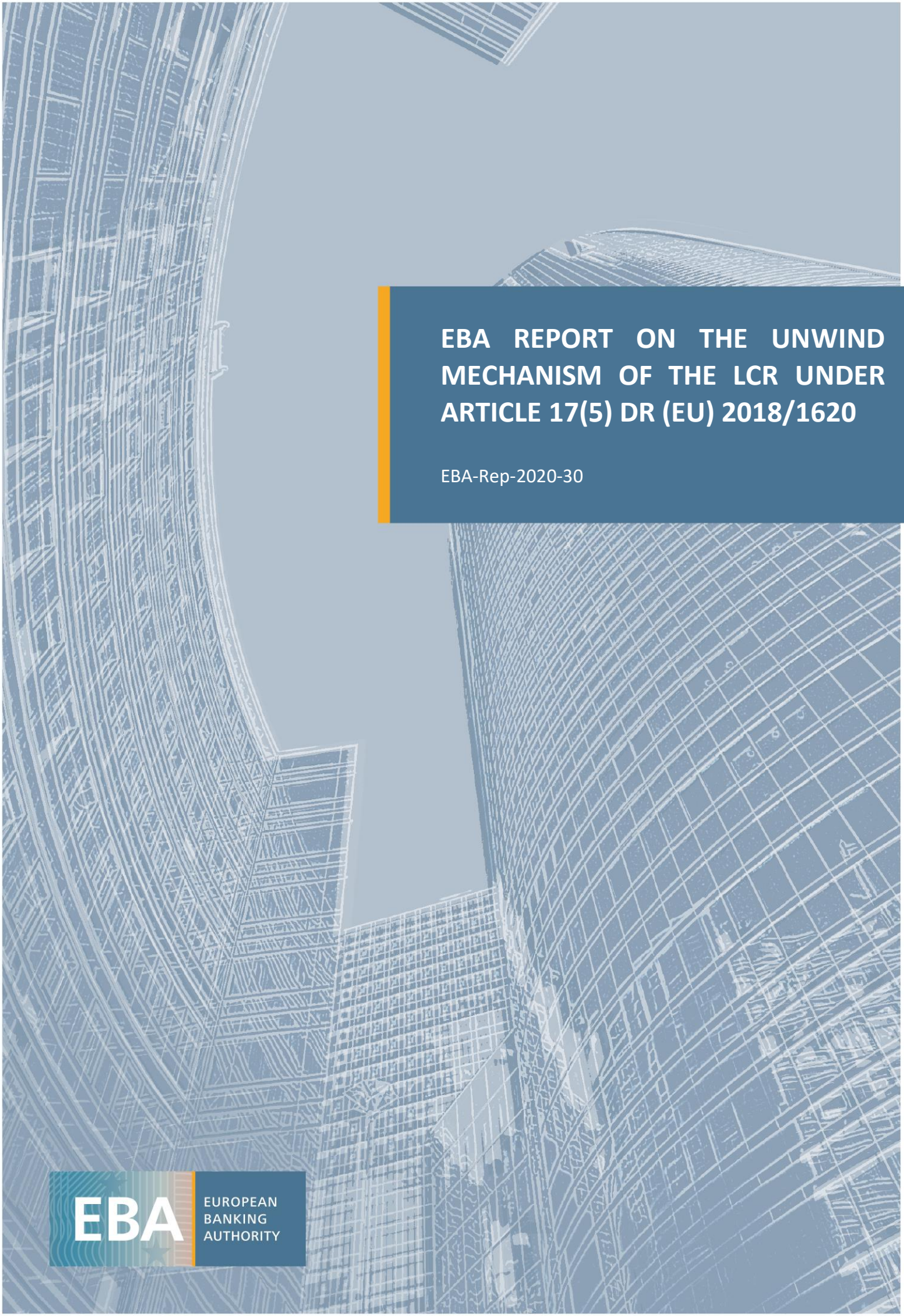

# EBA REPORT ON THE UNWIND MECHANISM OF THE LCR UNDER ARTICLE 17(5) DR (EU) 2018/1620

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EBA EUROPEAN BANKING AUTHORITY

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# Executive summary


*The objective of the report is the analysis of the unwind mechanism*

This report provides a discussion about the functioning of the unwind mechanism of the liquidity coverage ratio (LCR). It shows the actual effect of this mechanism over a period covering the most recent years. The analysis is based on common reporting (COREP) of larger EU banks[1]. The functioning of the mechanism under particular situations and the opportunity to change some technical aspects of the mechanism is also discussed.

*Based on current data, the effect of the unwind mechanism is limited*

At the end of December 2019, the aggregate effect of the unwind mechanism was an increase in the level 1 assets, although no material effect was produced in terms of LCR. In addition, at bank level, few cases could be detected in which the unwind mechanism caused a relevant reduction in the LCR, and in all these cases the LCR would also have been lower than the minimum without the unwind mechanism. The analysis shows that, even under the hypothesis of a huge reduction in the reserves, the specific effect of the unwind mechanism would be immaterial.

*With regard to the analysed period, changes to technical aspects of the unwind mechanism would not entail material impacts*

On the ground of available data, introducing a zero floor to avoid the components of the high-quality liquid assets (HQLA) becoming negative as a consequence of the unwind mechanism would not have effects in terms of the LCR based on current reporting data. In addition, better aligning of the unwind mechanism with the Basel LCR standards for what concerns the type of operations that are taken into consideration in the unwinding[2] would not have material impacts. The report analyses the functioning of the unwinding in the event of reverse repo operations, showing that, theoretically, in this case the effect would not be conservative enough. A possible solution could be to consider the lower of the LCR computed with and without the unwind mechanism. The materiality of these situations is limited.

*It is suggested that the analysis be extended*

It is recommended that the analysis be extended over the next years to gain more experience and to be able to include in the sample smaller banks after the Euclid project has entered into force.


[1] The report is provided under Article 509(1) of the Capital Requirements Regulation (CRR). The objective of the report is to monitor and evaluate the liquidity coverage requirements under Commission Delegated Regulation (DR) (EU) 2015/61.

[2] Only operations involving HQLA assets in both legs of the transactions for the Basel LCR standards and all the operations involving HQLA assets in at least one leg of the transaction for EU regulation.

# 1. Introduction

## 1.1 Background information

As part of Delegated Regulation (EU) No 61/2015 amended by Delegated Regulation (EU) No 1620/2018 (LCR DR), the EBA has been mandated under Article 17(5) of the LCR DR to report to the Commission, by 19 November 2020, on the technical suitability and possible unwarranted side effects of the unwind[3] mechanism envisaged in the computation of the liquidity coverage ratio (LCR).

> Article 17(5) of the LCR DR: *EBA shall, by 19 November 2020, report to the Commission on the technical suitability of the unwind mechanism set out in paragraphs 2 to 4 and on whether it is likely to have a detrimental impact on the business and risk profile of credit institutions established in the Union, on the stability and orderly functioning of financial markets, on the economy or on the transmission of monetary policy to the economy. This report shall assess the opportunity to change the unwind mechanism set out in paragraphs 2 to 4 and, where EBA finds either that the current unwind mechanism is technically not suitable or that it has a detrimental impact, it should recommend alternative solutions and evaluate their impact.*

The unwind mechanism is embedded in the calculation of the excess liquid asset amount (ELAA), which is the amount of liquid assets that is held in excess of the limits provided in the LCR DR and that is therefore to be deducted from the current holdings of high-quality liquid assets (HQLA) when calculating the LCR liquidity buffer. These caps are intended to reduce the reliance on less-liquid assets as part of the LCR liquidity buffer. The ELAA is not calculated based on the current holdings of HQLA. Instead, the LCR DR requires adjusted amounts of Level 1, Level 2A and Level 2B assets to be computed by unwinding all secured funding, secured lending or collateral swap transactions involving HQLA, on at least one leg of the transaction, that are maturing within 30 calendar days. In that sense, the unwind mechanism aims to prevent credit institutions from using short-term secured funding transactions (including repos[4] and collateral swaps) to circumvent the caps on the Level 1 covered bonds, as well as Level 2A and Level 2B assets, via short-term secured transactions.

[3] In finance, the term 'to unwind' is used to refer to the process of closing out a trading position; the term tends to be used when the trade is complex. The term 'unwinding' is more likely to be used when the buying or selling occurs over multiple transactions.

[4] A repurchase agreement (repo) is a short-term secured loan: one party sells securities to another and agrees to repurchase those securities later at a higher price. The securities serve as collateral. A reverse repurchase agreement (reverse repo) is the mirror of a repo transaction. In a reverse repo, one party purchases securities and agrees to sell them back for a positive return at a later date. Most repos are overnight transactions, although they can be longer.

Although there is general agreement about the purpose of the unwind mechanism — i.e. to hinder credit institutions from circumventing the caps and improving the LCR by borrowing liquid assets against less liquid assets through short-term transactions — concerns have been raised about the possibility that the unwind mechanism may have some unintended consequences. First, the unwind mechanism intervenes in the complex system of cap and floor foreseen in the quantification of the LCR, and this means that its effect is not easily understood. It is then mentioned that the use of short-term repos is a common tool for liquidity management, for both banks and market makers, and the unwind mechanism could reduce the incentives for banks to participate in this market. Moreover, in the event of a liquidity crisis of a given bank, a typical intervention of the central bank is obtained through short-term repo transactions. The unwind mechanism could then reduce the effectiveness of the role of the central bank as a lender of last resort.

## 1.2 Structure of the report

The report includes an analysis of the impact of the unwind mechanism for a sample of European banks. The impact is evaluated in terms of both the quantification of the L1 component of HQLA (the numerator of the LCR) and the quantification of the LCR itself. The analysis is extended for a period of over 3 years, i.e. from the end of 2016 to Q1 of 2020. It also includes a scenario analysis in which it is assumed that the amount of central bank reserves has been substantially cut. Furthermore, an analysis of alternative definitions of the unwind mechanism and an analysis of the functioning of the unwind mechanism in the event of reverse repo operations is presented. Section 2 provides an introduction to the rationale and the functioning of the unwind mechanism, including providing some (simplified) theoretical examples.

The empirical analysis is based on common reporting (COREP) data covering a sample of about 120 credit institutions in each year, representative of the 26 EU Member States and 2 EEA/EFTA states, that report COREP data to the EBA on a regular basis[5]. The sample covers both globally active institutions and other credit institutions. In terms of total assets, the sample covers approximately EUR 30 trillion (EUR 31 trillion including subsidiaries) or, on average, 83% of the total assets of the EU banking sector[6]. Country data should be interpreted with caution, because differences in the representativeness of the sample across countries may affect data comparability. Aggregated figures and charts in this report are based on COREP data reported at the highest level of consolidation. Unless stated otherwise, all average figures are weighted. Section 3 provides some additional details about the data used.

Relying on actual data reported under the regulatory reporting framework could produce results that are biased in some ways, because the figures may be adjusted by institutions to comply with the current unwind mechanism. Moreover, the time frame analysed reflects a period of specific liquidity (market) conditions that may not be comparable with the stress scenario as assumed in the LCR. For these reasons, some (simplified) theoretical examples have been introduced.

[5] Banks included in the sample reported not only LCR COREP data but also financial reporting (FINREP) data (amount of total assets). Banks that do not report the amount of total assets in FINREP have not been included in the analysis.

[6] The information on total assets of the EU has been obtained from the Statistical Data Warehouse of the European Central Bank (ECB).

The mandate in Article 17(5) of the LCR DR can be broken down into four points that are to be analysed separately:

- technical suitability;
- possible detrimental impact;
- transmission of monetary policy;
- opportunity to change.

The report dedicates a specific subsection of Section 4 to each point. The last subsection includes an analysis of the functioning of the unwind mechanism in the event of reverse repo operations.

# 2. The LCR and the unwind mechanism

## 2.1 The role of the unwind mechanism

The LCR is computed as the ratio between the amount of HQLA over the estimated amount of net liquidity outflows (net outflows) arising over 30 calendar days during a hypothetical stress scenario. The LCR is meant to ensure credit institutions' ongoing ability to meet short-term obligations, even in stressed conditions.

HQLA are assets with a high potential to be quickly converted into cash. HQLA are classified into three categories of liquid assets with decreasing liquidity levels: Level 1, Level 2A and Level 2B assets. The lower liquidity is reflected in certain pre-defined haircuts applied. Level 1 assets are not subject to haircuts (except for shares in CIUs investing in Level 1 assets and Level 1 extremely high-quality covered bonds), whereas Level 2A and Level 2B assets are subject to haircuts ranging from 15% to 55%. Among other assets, the category of Level 1 assets includes cash, withdrawable central bank reserves and securities issued or guaranteed by the central governments of EU Member States. The total amount of HQLA is calculated as:

- the current holdings of HQLA, minus
- the excess liquid asset amount.

The excess liquid asset amount is the amount of liquid assets that is held in excess of the limits provided in the LCR DR (and that is therefore to be deducted from the current holdings of HQLA). Recall that a maximum of 15% and 40% of the liquidity buffer may consist of Level 2B assets and Level 2 assets, respectively, and a minimum of 30% of the adjusted liquidity buffer has to be held in the form of Level 1 assets excluding extremely high-quality covered bonds (L1 excluding EHQCB) (see Article 17(1) of the LCR DR); thus, there is an implicit limit (cap) of 70% for Level 1 extremely high-quality covered bonds.

The objective of these limits (caps) is to avoid over-reliance on less-liquid assets. However, the excess liquid asset amount is not calculated based on the current holdings of liquid assets. Instead,

the LCR DR requires to compute adjusted amounts of Level 1, Level 2A and Level 2B assets by unwinding all secured funding, secured lending or collateral swap transactions involving HQLA (on at least one leg of the transaction) that are maturing within 30 calendar days (see Article 17(2) of the LCR DR). Credit institutions are not asked to resolve these short-term contracts but only to simulate the economic impact of the resolution of these contracts. In other terms, credit institutions are asked to evaluate the holdings of HQLA under the hypothesis that all the short-term contracts involving HQLA are not rolled over. The following simplified examples clarify the functioning of the unwind mechanism.

In the first example (see Table 1), the credit institution has computed net outflows equal to 300 for a period covering the next 30 calendar days. The credit institution is not involved in short-term transactions such as repos or swaps so that the adjusted amounts (i.e. the amount of HQLA after application of the unwind) are equal to the unadjusted amounts. The total amount of HQLA is 500, but, after the application of the haircuts, this amount is reduced to 341.8, which is still higher than the net outflows. However, the relative share of Level 2B is higher than the cap of 15% (150/341.8 = 44% > 15%).

Because of caps and floors on Level 1 and Level 2 assets, the ELAA is calculated as 116.2 and is subtracted from the current holdings of HQLA (post haircuts). The resulting LCR liquidity buffer of 225.6 is lower than the net outflows, i.e. the LCR is lower than 100%.

*Table 1: Theoretical example 1, bank not involved in short-term repos or swaps*

| no repo | | Pre Haircut | | | Haircut | After Haircut | |
|---|---|---|---|---|---|---|---|
| HQLA Category | | Pre Repo | Repo Amount | After repo | | Unadjusted | Adjusted |
| a | L1 excl. EHQCB | 140.0 | 0.0 | 140.0 | 0% | 140.0 | 140.0 |
| b | L1 EHQCB | 10.0 | 0.0 | 10.0 | 7% | 9.3 | 9.3 |
| c | L2A | 50.0 | 0.0 | 50.0 | 15% | 42.5 | 42.5 |
| d | L2B | 300.0 | 0.0 | 300.0 | 50% | 150.0 | 150.0 |
| | | 500.0 | | 500.0 | | 341.8 | 341.8 |
| Excess Liquidity Amount = | | | | | | | |
| = $(a_A+b_A+c_A+d_A)$ - min[ $(a_A+b_A+c_A+d_A)$ ; $a_A*100/30$ ; $(a_A+b_A)*100/60$ ; $(a_A+b_A+c_A)*100/85$ ] = | | | | | | | |
| = | | 116.2 | | | | | |
| Liquidity Buffer = | | $(a_U+b_U+c_U+d_U)$ - min[ $(a_U+b_U+c_U+d_U)$ ; Excess LA ] = | | | | | |
| = | | **225.6** | | | | | |
| Net Outflows = | | **300.0** | | | | | |
| LCR = | | **75.2%** | | | | | |

In the second example (see Table 2), the credit institution enters into a 5-day repo transaction with the domestic central bank in an attempt to temporarily increase its liquidity position. The credit institution obtains 35 in cash (i.e. Level 1 assets) backed by 70 in Level 2B assets and 117.6 in Level 2A assets backed by 200 in Level 2B assets. In this example, it is assumed that the difference between the amount of cash and Level 2A assets received and the amount of collateral classified as Level 2B assets reflects the haircuts applied for the computation of HQLA. The total amount of

HQLA post application of the haircuts is 341.8. Notice that this amount is the same as in the previous example. This happens because it has been assumed that, in the repo, the exchange rate between assets of different levels of liquidity is equal to the haircuts applied for the computation of HQLA[7]. However, the composition of HQLA has changed, e.g. the relative share of the Level 2B assets is now only 15/341.8 = 4%.

In the absence of the application of the unwind mechanism, the correction needed to ensure the cap and floors on Level 1 and Level 2 assets (i.e. the ELAA) would be only 34.6, meaning that the liquidity buffer would be 307.2, that is, higher than the net outflows. However, in this way the LCR liquidity buffer would not accurately reflect the actual composition of HQLA during 30 calendar days under the assumption of a full unwind of short-term secured transactions. Indeed, the repo operation matures in 5 days, and there is no certainty that it can be rolled over.

In the second example, due to the application of the unwind mechanism, it is possible to retrieve the value of the ELAA that was observed before the credit institution entered into the repo (i.e. the same numbers as those provided under example 1).

For the sake of completeness, it should be mentioned that, if the transactions have not been undertaken with the domestic central bank and unless the credit institution has been (and still is) constrained by the cap on inflows, the transactions would also affect the computation of net outflows, as both transactions would increase the liquidity inflows.

[7] Assuming that the exchange rate equals the haircuts is a noticeable simplification. In this way, it is possible to avoid discussing the choice of the exchange rate. It must be noted, however, that the examples are meant only for introducing some concepts, whereas all the conclusions are based on the empirical evidence, whereby the exchange rates are the real ones.

*Table 2: Theoretical example 2, bank involved in a repo*

| | 5-days repo: L2B against L2A and cash | | Pre Haircut | | | Haircut | After Haircut | |
|---|---|---|---|---|---|---|---|---|
| | HQLA Category | | Pre Repo | Repo Amount | After repo | | Unadjusted | Adjusted |
| | a | L1 excl. EHQCB | 140.0 | 35.0 | 175.0 | 0% | 175.0 | 140.0 |
| | b | L1 EHQCB | 10.0 | 0.0 | 10.0 | 7% | 9.3 | 9.3 |
| | c | L2A | 50.0 | 117.6 | 167.6 | 15% | 142.5 | 42.5 |
| | d | L2B | 300.0 | -270.0 | 30.0 | 50% | 15.0 | 150.0 |
| | | | 500.0 | | 382.6 | | 341.8 | 341.8 |
| with the unwind mechanism | Excess Liquidity Amount = $= (a_A+b_A+c_A+d_A) - \min[ (a_A+b_A+c_A+d_A) ; a_A*100/30 ; (a_A+b_A)*100/60 ; (a_A+b_A+c_A)*100/85 ] =$ | | | | | | | |
| | = | 116.2 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **225.6** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **75.2%** | | | | | | |
| without the unwind mechanism | Excess Liquidity Amount = $= (a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; a_U*100/30 ; (a_U+b_U)*100/60 ; (a_U+b_U+c_U)*100/85 ] =$ | | | | | | | |
| | = | 34.6 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **307.2** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **102.4%** | | | | | | |

In the event of a reverse repo, a credit institution with excess liquidity uses part of its cash to obtain assets providing higher returns but with lower liquidity levels (see Table 3). Specifically, the credit institution has lent 250 in cash and received 500 in Level 2B assets. Without applying the unwind mechanism, the LCR would be 32.9%, reflecting the lower amount of liquidity held by the credit institution. However, computing the LCR with the unwind mechanism results in an LCR of 138%. In the annex, a more sophisticated example is presented in which two bundled transactions are involved.

The effect of the unwind mechanism in the event of reverse repo operations can raise some doubts. In the example, the credit institution has an LCR equal to 138%, but it is facing a possible period of liquidity stress, triggering potential net outflows of 300 with only 50 in cash. Even if in 5 days the operation matures and, in the event of stress, the credit institution decides not to reuse the cash to be received, there is the possibility that the counterpart of the repo might not able to meet its obligations. More generally, under the LCR regulation, HQLA need to be available from day 1, and this is because it is possible that the outflows in the event of stress are more intensive during the first days.

It is also important to note that, in this situation, the type of risk has been to some extent changed from liquidity to counterparty risk. However, the problem is substantially the same: the credit institution might not be able to face all the outflows (on day 1)[8].

In this example, the amount of the net outflows has been kept constant. In practice, the reverse repo could shape an increase in the outflow that could partly mitigate the problem whereby the counterpart is not the central bank and the inflows floor was not binding before the operation.

*Table 3: Theoretical example 3, bank involved in a reverse-repo*

| | 5-days reverse repo: cash against L2B | | Pre Haircut | | | Haircut | After Haircut | |
|---|---|---|---|---|---|---|---|---|
| | HQLA Category | | Pre Repo | Repo Amount | After repo | | Unadjusted | Adjusted |
| | a | L1 excl. EHQCB | 300.0 | -250.0 | 50.0 | 0% | 50.0 | 300.0 |
| | b | L1 EHQCB | 10.0 | 0.0 | 10.0 | 7% | 9.3 | 9.3 |
| | c | L2A | 50.0 | 0.0 | 50.0 | 15% | 42.5 | 42.5 |
| | d | L2B | 140.0 | 500.0 | 640.0 | 50% | 320.0 | 70.0 |
| | | | 500.0 | | 750.0 | | 421.8 | 421.8 |
| with the unwind mechanism | Excess Liquidity Amount = $= (a_A+b_A+c_A+d_A) - \min[ (a_A+b_A+c_A+d_A) ; a_A*100/30 ; (a_A+b_A)*100/60 ; (a_A+b_A+c_A)*100/85 ] =$ | | | | | | | |
| | = | 7.9 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **413.9** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **138.0%** | | | | | | |
| without the unwind mechanism | Excess Liquidity Amount = $= (a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; a_U*100/30 ; (a_U+b_U)*100/60 ; (a_U+b_U+c_U)*100/85 ] =$ | | | | | | | |
| | = | 323.0 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **98.8** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **32.9%** | | | | | | |

## 2.2 The terms of the trade-off: the operations with the central bank

On closer inspection, the debate about the unwind mechanism that led to the mandate in Article 17(5) of the LCR DR is centred on a trade-off. On the one hand, the declared aim of the unwind mechanism is to make credit institutions structurally less dependent on short-term financing transactions and central bank liquidity provision. On the other hand, there are concerns

[8] It should be considered that the LCR does not have to address counterparty credit risk. Moreover, the case of loss on reverse repos due to the default of the counterparty might be not fully consistent with the stress scenario envisaged in the LCR framework.

about the possibility that the change in the credit institutions' behaviour could affect the financial system and that some of the tools available to the central bank become less effective.

As regards the LCR treatment of short-term central bank operations, Article 28(3)(a) of the LCR DR stipulates that secured lending transactions (repos) with central banks that are maturing within 30 calendar days must not be counted as outflows. This provision is justified under the hypothesis that, in times of stress, the central bank is expected to roll over any secured funding transactions. However, central bank operations are not excluded from the unwind mechanism. In other terms, repos with central banks with a residual maturity of up to 30 calendar days affect the LCR asymmetrically: the numerator of the LCR is (potentially) modified through the unwind mechanism, whereas the denominator is not affected because no outflows are considered.

This asymmetric treatment can be seen as the effect of two opposing needs: on the one hand, recognising the role of the central bank as the lender of last resort, and, on the other hand, reducing the credit institutions' reliance on central bank operations for the purpose of complying with the LCR. In fact, exempting central bank transactions maturing within 30 calendar days from the unwind mechanism would further encourage credit institutions to access the central bank short-term facilities for regulatory purposes, rather than fulfil their structural liquidity needs.

With Delegated Regulation (EU) 2015/61, a corrigendum to the unwind mechanism has been introduced, with the aim of further recognising the role of the central bank in a situation of stress. Specifically, the competent authority may, on a case-by-case basis, waive the application of the unwind mechanism (after having consulted the relevant central bank) (see Article 17(4) of the LCR DR). Due to the recent introduction of this waiver, it was not possible to assess the effectiveness and reactivity of this new measure.

Finally, it is worth mentioning that the regulation provides a general framework for dealing with breaches of the LCR requirement. More specifically, pursuant to Article 412(1) of Regulation (EU) No 575/2013 in conjunction with Article 4(3) of the LCR DR, credit institutions can make use of their HQLA during times of stress, even if this results in the LCR falling below 100% during such a stress period. This implies that the breach of the general LCR minimum level of 100% during times of stress, including when this is particularly driven by the application of the unwind mechanism, does not necessarily imply a breach of the LCR DR.

## 2.3 The terms of the trade-off: the use of repo markets as a liquidity tool

The repurchase agreement, or 'repo', market is an important part of the financial system. The repo market allows financial institutions that own securities to borrow cheaply, and parties with excess of cash (e.g. money market mutual funds) to earn a small return on that cash without much risk, because securities serve as collateral.

Central banks use repos and reverse repos to conduct monetary policy. When the central bank buys securities from a credit institution, it is injecting reserves into the financial system. Conversely, when the central bank sells securities (with an agreement to repurchase), it is draining reserves.

Credit institutions normally rely on short-term funding, which exposes them to rollover risk. In Gorton (2009), it is argued that the financial panic of 2007-2008 stemmed from a run on the repo market rather than a run on monetary deposits, as in earlier banking panics. Concerns about the liquidity of markets for the bonds used as collateral led to increases in repo 'haircuts' — the amount of collateral required for any given transaction. The authors state that, with declining asset values and increasing haircuts, the US banking system was effectively insolvent for the first time since the Great Depression.

The introduction of the unwind mechanism in the computation of the LCR appears to be consistent with the goal of reducing the credit institutions' ability to circumvent the caps on HQLA by entering into short-term operations. Indeed, as showed in the second example in Section 2, in the absence of the unwind mechanism, short-term repo operations could be used to obtain a higher level of HQLA without really improving the liquidity of the credit institution.

However, the unwind mechanism could lead banks to reduce the lending activity due to the necessity to increase the level of liquid assets. As an example, consider a case in which institutions may be offered the use of short-term lending operations of the central bank to expand lending to the real economy. If they use such operations, institutions' LCR will deteriorate, as the money borrowed from the central bank will still be subject to the unwind mechanism (i.e. deducted from the numerator), even if this money has already been extended to loan customers. This may discourage institutions from using central bank lending to support credit supply to the real economy.

In quite general terms, it is clear that any prudential measure could be seen as limiting the ability of credit institutions to expand the loans. This is true for the leverage or the limits on large exposures, and so on. There are clearly some trade-offs. The problem is always finding an appropriate balance, but then, when shocks occur, it is often necessary to introduce some ad hoc flexibility, and that is precisely the reason why the unwinding waiver has been introduced in the regulation.

For example, Curfman (2019) not only identifies adverse effects on credit supply to the non-financial sector, but also demonstrates an economically meaningful decline in the odds of failure and identifies channels through which liquidity regulations reduce failure probabilities. Similarly, Robert (2019) examines changes in liquidity creation by US credit institutions that are required to implement the LCR ('LCR banks') relative to smaller credit institutions that are not subject to the LCR ('non-LCR banks'). He finds that LCR banks create less liquidity per dollar of assets than non-LCR banks. However, he also finds that LCR banks are more resilient, as they contribute less to fire-sale risk than non-LCR banks.

The lower reliance of credit institutions on short-term markets could also have effects on monetary policy. Bech (2012) introduces an LCR requirement into a standard model of monetary policy. He demonstrates that the LCR could change credit institutions' demand for liquid assets and their behaviour in money markets. As many central banks implement monetary policy by targeting short-term interbank rates, it is important to understand the nature of these changes. In particular, the model shows that, if credit institutions face the possibility of an LCR shortfall, then the usual link

between open market operations and the overnight interest rate changes and the short end of the yield curve becomes steeper.

It is also interesting to know that, recently, the Federal Open Market Committee has stated that it would like to operate monetary policy in the longer run, with an ample supply of reserves in the banking system. This increase in the projected level of reserves needed to implement monetary policy reflects, in large part, credit institutions' increased demand for reserves resulting from new liquidity regulations.

All these possible side effects – in brief, a reduction in the lending activities and increased demand for excess reserves – are connected with the LCR regulation in general and not the unwind mechanism in particular. It is clear, however, from the discussion in Section 2, that, without the unwind mechanism, it would be possible to increase HQLA (and to potentially increase LCR levels if the transactions are undertaken with the domestic central bank) by relying on short-term operations. This mechanism appears to be central to shaping a higher demand of liquid assets such as excess reserves and reducing the reliance on short-term operations.

# 3. The data

## 3.1 The sample and period

We rely on micro-data of European credit institutions. The main database is the EBA supervisory data, which contain quarterly or monthly financial data for a sample of large credit institutions in the EU. Uniform reporting requirements were set by the EBA with the Commission Implementing Regulation on supervisory reporting (EU) No 680/2014 (COREP). Data are collected at the highest level of consolidation for a sample of large credit institutions. Before being released to users, the data go through an intensive data quality process in which all stakeholders (credit institutions, supervisory authorities and the EBA) are involved. The mandatory quality checks (i.e. validation rules) are part of the framework and are in place to monitor the consistency and plausibility of the data submitted first to the authorities and thereafter to the EBA.

The analysis is done on a sample of about 120 credit institutions in each year, representative of 26 EU Member States and 2 EEA/EFTA states, that report COREP data to the EBA on a regular basis[9]. The data exploited come mainly from supervisory reporting templates C 72.00-C 76.00 of COREP. The sample covers both globally active and other significant institutions (G-SIIs and O-SIIs), as well as other credit institutions. In terms of total assets, the sample covers approximately EUR 30 trillion (EUR 31 trillion including subsidiaries) or, on average, 83% of the total assets of the EU banking sector[10]. Country data should be interpreted with caution, because differences in the representativeness of the sample across countries may affect data comparability. Unless stated

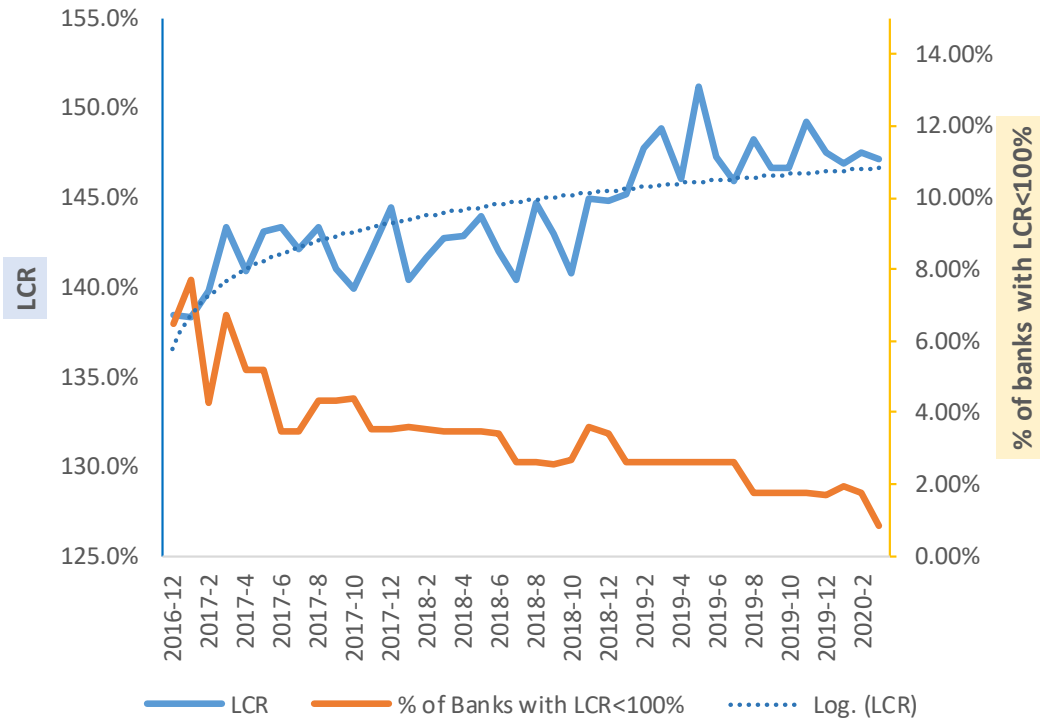
[9] Banks included in the sample not only reported LCR COREP data but also FINREP data (amount of total assets). Banks that do not report the amount of total assets in FINREP have not been included in the analysis.

[10] The information on total assets of the EU has been obtained from the Statistical Data Warehouse of the ECB.

otherwise, all average figures are weighted. The analysis is extended for a period of over 3 years, i.e. from the end of 2016 to Q1 of 2020, and the frequency of observation is monthly.

During the period considered, the credit institutions' liquidity situation improved substantially. Figure 1 shows the average LCR for the sample. It also provides the relative number of credit institutions with LCR numbers below the general minimum level of 100%.

*Figure 1: Average LCR and percentage of banks with LCR < 100%*




The next table (Table 4) shows the LCR number of credit institutions per country at the end of each year. The number of credit institutions may change due to mergers and acquisitions. Subsidiaries are excluded. It also shows the total amount of the credit institutions' total assets.

*Table 4: Sample composition at the end of each year — number of banks and total assets (TA)*

| | Dec-16 | | Dec-17 | | Dec-18 | | Dec-19 | | Mar-20 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Country | No Banks | TA, bln | No Banks | TA, bln | No Banks | TA, bln | No Banks | TA, bln | No Banks | TA, bln |
| **All** | **123** | **23,478.3** | **114** | **22,686.4** | **117** | **22,781.4** | **117** | **23,511.5** | **116** | **25,293.7** |
| **AT** | 8 | 492.8 | 7 | 504.9 | 6 | 500.3 | 6 | 526.1 | 6 | 547.2 |
| **BE** | 6 | 713.4 | 6 | 691.2 | 6 | 650.5 | 6 | 637.2 | 6 | 670.2 |
| **BG** | 1 | 4.7 | 1 | 4.6 | 1 | 4.9 | 1 | 5.5 | 1 | 5.4 |
| **CY** | 3 | 42.5 | 3 | 42.7 | 2 | 37.4 | 2 | 36.5 | 1 | 19.6 |
| **DE** | 17 | 4,116.1 | 17 | 3,877.3 | 16 | 3,713.9 | 15 | 3,532.2 | 16 | 3,940.6 |
| **DK** | 4 | 711.7 | 4 | 719.4 | 4 | 709.3 | 4 | 758.0 | 4 | 789.8 |
| **EE** | 1 | 0.9 | 1 | 1.8 | 1 | 1.7 | 2 | 16.8 | 2 | 16.5 |
| **ES** | 14 | 3,307.3 | 12 | 3,235.3 | 12 | 3,237.8 | 12 | 3,340.3 | 12 | 3,418.6 |
| **FI** | 2 | 147.7 | 2 | 152.3 | 4 | 682.8 | 4 | 686.2 | 4 | 742.4 |
| **FR** | 10 | 6,770.6 | 9 | 6,560.2 | 9 | 6,827.3 | 9 | 7,223.7 | 9 | 8,105.5 |
| **GR** | 4 | 288.9 | 4 | 250.5 | 4 | 243.4 | 4 | 250.4 | 4 | 258.7 |
| **HU** | 1 | 36.6 | 1 | 42.6 | 1 | 45.6 | 1 | 61.0 | 1 | 60.9 |
| **IE** | 5 | 301.2 | 5 | 279.1 | 7 | 307.1 | 6 | 303.8 | 6 | 312.2 |
| **IS** | | | | | 3 | 27.2 | 3 | 27.3 | 3 | 25.5 |
| **IT** | 15 | 2,277.3 | 11 | 2,218.6 | 11 | 2,196.0 | 11 | 2,422.4 | 11 | 2,466.6 |
| **LT** | | | | | 1 | 2.2 | 1 | 2.5 | 1 | 2.6 |
| **LU** | 2 | 51.2 | 2 | 54.1 | 3 | 57.1 | 3 | 60.0 | 3 | 65.1 |
| **LV** | 1 | 4.0 | 1 | 3.8 | | | 1 | 3.7 | 1 | 3.9 |
| **MT** | 2 | 13.6 | 2 | 14.4 | 2 | 14.8 | 2 | 15.5 | 2 | 15.9 |
| **NL** | 5 | 2,114.4 | 5 | 2,040.6 | 5 | 2,057.6 | 5 | 2,070.2 | 5 | 2,212.2 |
| **NO** | 3 | 307.8 | 3 | 292.0 | 3 | 285.4 | 3 | 304.0 | 3 | 301.6 |
| **PL** | 1 | 64.2 | 1 | 70.5 | 1 | 74.9 | 1 | 81.2 | 1 | 79.6 |
| **PT** | 6 | 283.9 | 5 | 248.9 | 5 | 244.6 | 5 | 249.0 | 5 | 249.8 |
| **RO** | 1 | 11.5 | 1 | 12.8 | 1 | 16.8 | 1 | 19.2 | 1 | 20.0 |
| **SE** | 8 | 1,395.8 | 8 | 1,348.4 | 6 | 821.5 | 6 | 855.9 | 6 | 940.2 |
| **SI** | 3 | 20.5 | 3 | 20.8 | 3 | 21.4 | 3 | 23.1 | 2 | 23.1 |

# 4. The results

## 4.1 Technical suitability

As regard the requirement to verify the technical suitability of the unwind mechanism, starting from the detailed data provided in COREP, supervisory reporting template C 76.00, the computations needed for the quantification of the ELAA and the overall LCR liquidity buffer have been reproduced. From December 2016 to March 2020, with monthly data, we checked 5 243 computations of the ELAA and the overall LCR liquidity buffer.

The supervisory reporting template C 76.00 provides the amount of assets classified as L1 excluding EHQCB, L1 EHQCB, Level 2A and Level 2B both before and after the application of the unwind mechanism. The details of the positive and negative flows are also provided. Table 5 shows an example of data reported by one credit institution for a given reference date. In the first line (row 40), the amount of L1 excluding EHQCB before the application of the unwind mechanism is reported. In the subsequent lines (rows 50-80), there are the expected flows maturing within 30 calendar days. In the last line (row 90), there is the amount of the assets classified as L1 excluding EHQCB that should be obtained after having deducted the outflows and summed the inflows. It can be noted that both inflows and outflows are reported, meaning, for example, that the credit institution is involved in both repos and reverse repos; however, the maturity of the operations can be different (but lower than 30 calendar days), and also the collaterals and the counterparties may vary.

*Table 5: Example of reporting under the template C76.00*

| Row | L1 excluding EHQCB | Euro | |
|---|---|---|---|
| 40 | Unadjusted value (pre-unwind) | 5 542 402 467 | |
| 50 | Collateralised outflows maturing within 30 days | 129 991 870 | Unwind mechanism |
| 60 | Collateralised inflows maturing within 30 days | 9 860 858 | |
| 70 | Cash outflows maturing within 30 days | 1 010 005 574 | |
| 80 | Cash inflows maturing within 30 days | 135 745 541 | |
| 90 | Adjusted value (post-unwind) | 4 548 011 423 | |

The liquidity buffer (the numerator of the LCR) is obtained by summing the unadjusted amount of L1 and L2 assets and then subtracting the ELAA:

$$Liquid\ Buffer = \left(L1\_exclEHQCB_{UNADJ} + L1\_EHQCB_{UNADJ} + L2A_{UNADJ} + L2B_{UNADJ}\right) -$$

$$min\left[\left(L1\_exclEHQCB_{UNADJ} + L1\_EHQCB_{UNADJ} + L2A_{UNADJ} + L2B_{UNADJ}\right); ELAA\ amount\right]$$

The ELAA is computed using the adjusted amounts (i.e. after the application of the unwind mechanism) of L1 and L2 assets.

The reported unadjusted amounts and the reported outflows and inflows of cash and/or collateral have been exploited to obtain the adjusted amounts and then compute the ELAA and the overall LCR liquidity buffer. We found only one problem for one bank in March 2017: in practice, the results obtained were different from reported figures. However, all the other data points of this bank have no problems.

Clearly, this analysis is limited to the existing reporting data[11]. Indeed, these data are the result of credit institutions' adjustments to the calculation procedure described by the LCR DR. In a sense, it is not surprising that credit institutions have adapted to this procedure in a way to comply with the LCR minimum requirement. For this reason, the report also presents hypothetical cases in order to study possible technical shortcomings of the formulae and potential compensation measures taken by credit institutions. These theoretical examples are necessarily simplified, and, in particular, they do not take into consideration the possible increase in the outflows. Keeping the net outflows constant allows attention to be better concentrated on the unwind mechanism. The effects on the net outflows could vary depending on the counterpart (central bank) or because, by increasing the outflows, the inflows floor could also increase so that the net outflows could not change. All these effects are not directly related to unwinding.

First, consider a credit institution that has no HQLA at all (see Table 6). At the reporting date, the credit institution may make an overnight collateral swap, borrowing Level 2B assets against non-HQLA. In this case, the adjusted value of any HQLA category would be zero, i.e. no excess amounts would be calculated. Hence, the credit institution would report a positive liquidity buffer amounting to the liquidity value of the borrowed Level 2B assets, although it has no Level 1 assets and the Level 2B assets have to be returned within the LCR horizon. In practice, this arbitrage would be possible only if such a transaction was made with the domestic central bank or the input floor was binding. Otherwise, the credit institution would need to report a liquidity outflow.

In this case, a solution could be to compute the LCR (more precisely, the excess liquidity amount) with and without the unwind mechanism and take into consideration the minimum of the two.

It was not possible to find similar situations in the sample observed. This implies that, at least for the period and for the institutions used for this report, this situation is not relevant and only theoretical.

[11] Given that the data are available only at the consolidated level, the results are not relevant for the purpose of the assessment of the impact of the unwinding mechanism on credit institutions on an individual basis.

*Table 6: Theoretical example 4, number of L1 and L2 assets*

| No L1 and L2A, swap maturing in 30 days between non HQLA and L2B assets | | | Pre Haircut | | | Haircut | After Haircut | |
|---|---|---|---|---|---|---|---|---|
| | HQLA Category | | Pre Repo | Repo Amount | After repo | | Unadjusted | Adjusted |
| | a | L1 excl. EHQCB | 0.0 | 0.0 | 0.0 | 0% | 0.0 | 0.0 |
| | b | L1 EHQCB | 0.0 | 0.0 | 0.0 | 7% | 0.0 | 0.0 |
| | c | L2A | 0.0 | 0.0 | 0.0 | 15% | 0.0 | 0.0 |
| | d | L2B | 0.0 | 600.0 | 600.0 | 50% | 300.0 | 0.0 |
| | | | 0.0 | | 600.0 | | 300.0 | 0.0 |
| with the unwind mechanism | Excess Liquidity Amount = $= (a_A+b_A+c_A+d_A) - \min[ (a_A+b_A+c_A+d_A) ; a_A*100/30 ; (a_A+b_A)*100/60 ; (a_A+b_A+c_A)*100/85 ] =$ | | | | | | | |
| | = | | 0.0 | | | | | |
| | Liquidity Buffer = | | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | |
| | = | | **300.0** | | | | | |
| | Net Outflows = | | **300.0** | | | | | |
| | LCR = | | **100.0%** | | | | | |
| without the unwind mechanism | Excess Liquidity Amount = $= (a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; a_U*100/30 ; (a_U+b_U)*100/60 ; (a_U+b_U+c_U)*100/85 ] =$ | | | | | | | |
| | = | | 300.0 | | | | | |
| | Liquidity Buffer = | | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | |
| | = | | **0.0** | | | | | |
| | Net Outflows = | | **300.0** | | | | | |
| | LCR = | | **0.0%** | | | | | |

Second, consider a credit institution that conducts an LTRO with the ECB using non-HQLA collateral (see Table 7). If the maturity of this operation falls within the LCR horizon, there will be a net effect on the adjustment to the stock of Level 1 assets. Adjusted Level 1 assets can become negative if the funds received have been reused and invested in non-Level 1 assets[12], thus resulting in an increase in the excess amount to be deducted from the current holdings of HQLA. This is more than would be necessary to ensure that any excess amounts of non-Level 1 assets are deducted from the buffer, for which it would be sufficient to set the adjusted amounts at zero.

[12] In the example, the after-repo amount is 200 instead of 400, because 200 has been used for granting loans.

*Table 7: Theoretical example 4, swap between no HQLA assets and cash*

| Swap between no HQLA assets and cash, part of the cash received have been used | | | Pre-Haircut | | | Haircut | After-Haircut | |
|---|---|---|---|---|---|---|---|---|
| | | HQLA Category | Pre Repo | Repo Amount | After repo | | Unadjusted | Adjusted |
| | a | L1 excl. EHQCB | 0.0 | 400.0 | 200.0 | 0% | 200.0 | -200.0 |
| | b | L1 EHQCB | 50.0 | 0.0 | 50.0 | 7% | 46.5 | 46.5 |
| | c | L2A | 500.0 | 0.0 | 500.0 | 15% | 425.0 | 425.0 |
| | d | L2B | 800.0 | 0.0 | 800.0 | 50% | 400.0 | 400.0 |
| | | | 1,350.0 | | 1,550.0 | | 1,071.5 | 671.5 |
| with the unwind mechanism | Excess Liquidity Amount = $= (a_A+b_A+c_A+d_A) - \min[ (a_A+b_A+c_A+d_A) ; a_A*100/30 ; (a_A+b_A)*100/60 ; (a_A+b_A+c_A)*100/85 ] =$ | | | | | | | |
| | = | 1,338.2 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **0.0** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **0.0%** | | | | | | |
| without the unwind mechanism | Excess Liquidity Amount = $= (a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; a_U*100/30 ; (a_U+b_U)*100/60 ; (a_U+b_U+c_U)*100/85 ] =$ | | | | | | | |
| | = | 660.7 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **410.8** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **136.9%** | | | | | | |

Under the Basel LCR standards, the excess liquid asset amount of HQLA is calculated by setting a floor of zero to the individual categories of the adjusted amount of HQLA.

In the example above, the ELAA is equal to 1 338.2. By setting a floor of zero to the adjusted Level 1 assets, the ELAA would be reduced to 871.5. However, it must be noticed that the LCR is null in both cases. The difference then is limited to the computation of the ELAA, whereas the LCR liquidity buffer is zero and so is the LCR.

It has been deepened the effective cases of negative figures resulting for the adjusted amount of Level 1 assets (excluding EHQCB) from the application of the unwind mechanism. It was possible to find, overall (the entire period with monthly frequency and all the credit institutions), 87 cases presenting a negative value for the amount of Level 1 assets excluding EHQCB after the application of the unwind mechanism. The number of cases observed in each month decreased through the period, and, starting from Q3 2019, it was no longer possible to detect this situation.

In most of these cases, the LCR was null. In only 5 out of 87 cases was the LCR higher than '0', and in all of them the unwind mechanism produced a reduction in the LCR. However, computing the ELAA with a zero floor on the adjusted values would not have changed the LCR value. Table 8

provides the details of these five cases, along with the effect of the unwind mechanism having set a zero floor on the L1 adjusted figures.

*Table 8: Details of cases with negative L1 excluding EHQCB after the unwind mechanism and LCR > 0*

| Date | L1 unadjusted, EUR bln | L1 adjusted, EUR bln | LCR (%) | | |
|---|---|---|---|---|---|
| | | | Unwind | No unwind | Unwind ([a]) |
| 31.12.2016 | 7.5 | -0.5 | 107.7 | 129.1 | 107.7 |
| 31.10.2017 | 0.8 | -0.1 | 8.2 | 12.6 | 8.2 |
| 31.10.2018 | 1.7 | -0.6 | 5.9 | 34.1 | 5.9 |
| 31.11.2018 | 1.6 | -0.4 | 13.4 | 33.4 | 13.4 |
| 31.1.2019 | 1.5 | -0.3 | 3.4 | 24.1 | 3.4 |

([a]) Negative adjusted L1 amount has been set to zero.

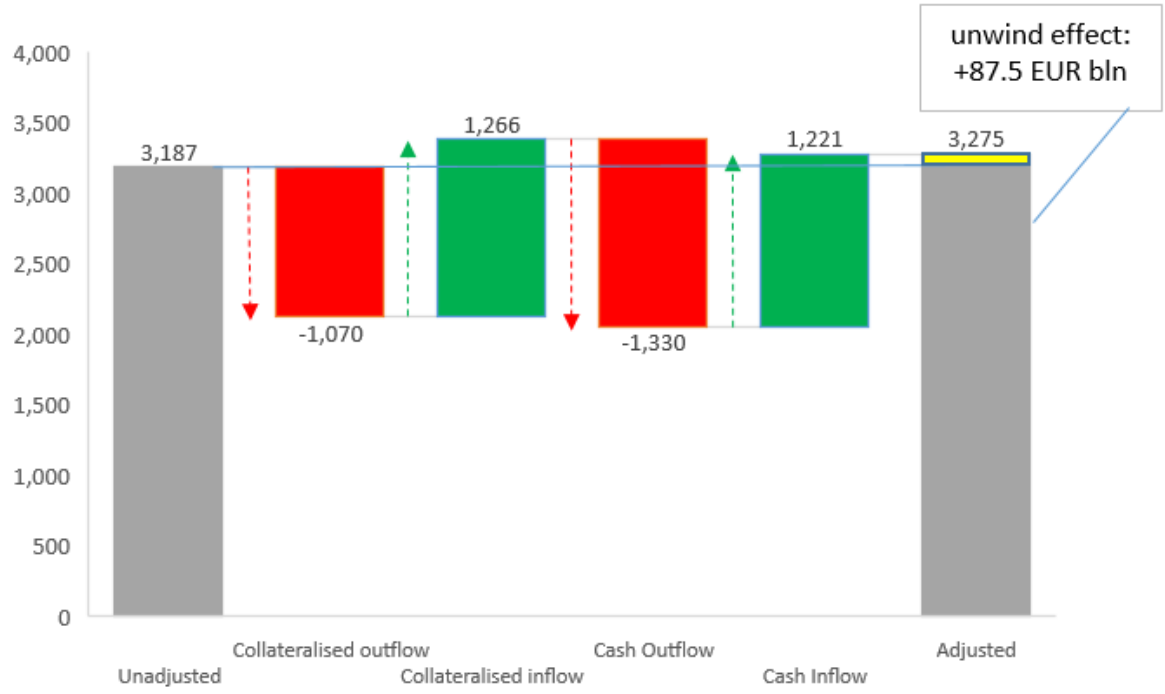
Even if there is no evidence that the absence of this floor has a detrimental impact, it could be argued that it is unjustified that the adjusted amount can become negative. Indeed, the motivation of the unwind mechanism is to avoid circumventing the composition limits, but, if the assets received have been reused for non-HQLA purposes (such as granting loans), then the transaction has not been used to circumvent the limits and so there is no reason to penalise the institution. However, a negative adjusted amount provides some valuable information. It indeed reveals that part of the assets received though a short-term transaction is not available, because it is committed to a, possibly, long-term transaction.

## 4.2 Possible detrimental impact

In this section, the effect of the unwind mechanism under two aspects is examined. First, the impact on the quantification of the amount of Level 1 assets excluding EHQCB assets is analysed, and then the impact on the determination of the LCR is examined.

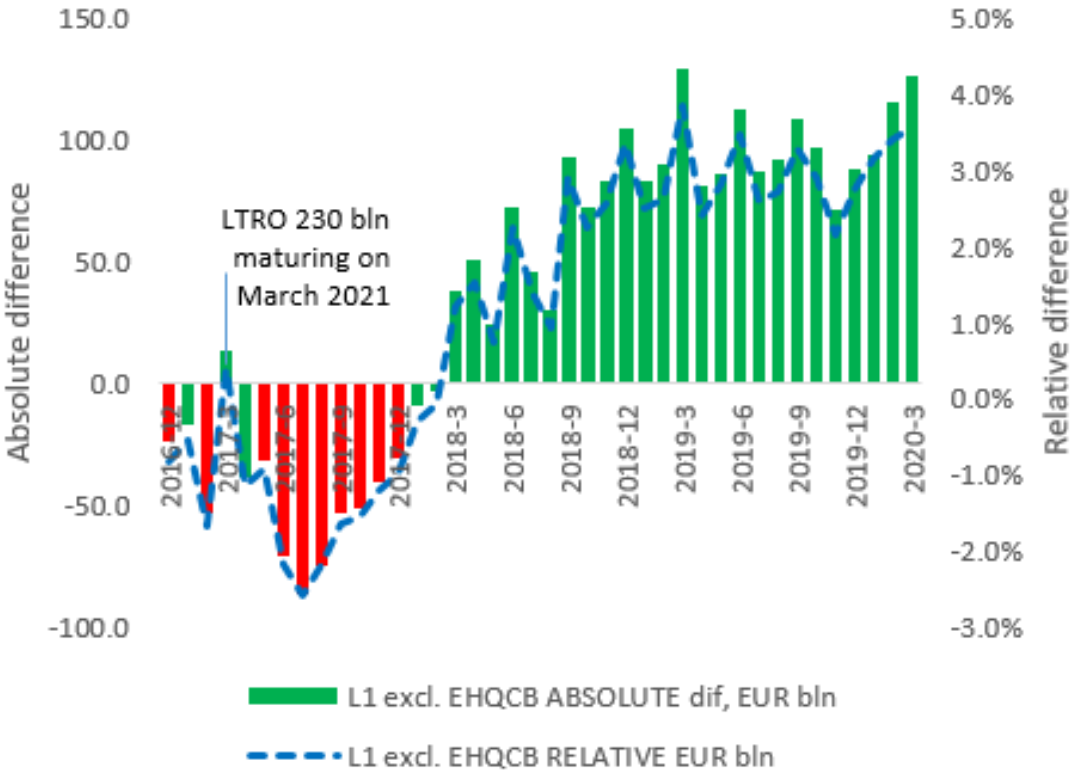
As of the reporting reference date of the end of December 2019, the impact of the unwind mechanism was, at aggregate level, positive: the amount of Level 1 assets excluding EHQCB was higher after the application of the unwind mechanism, with an increment of EUR 88 billion. This result implies that the credit institutions in the sample were, at aggregate level, providing short-term liquidity (the amount of reverse repos exceeded the amount of repos). Given that also for Level 2A assets the impact of the unwind mechanism was positive and it was negative for only about EUR 18 billion with regard to the Level 2B assets, it can be argued that the credit institutions are providing Level 1 assets against less-liquid assets. Figure 2 depicts the effect of the unwind mechanism on the amount of Level 1 assets excluding EHQCB.

*Figure 2: Aggregate effect of the unwinding of short-term (< 30 days) operations on the L1 excluding EHQCB assets, December 2019.* Red bars represent outflows (collateralised outflows for reverse repo and cash outflow for repo). Green bars represent inflows (collateralised inflows for repo and cash inflows for reverse repo).




The same result (i.e. the unwinding of short-term operations produces an increase in the amount of Level 1 assets excluding EHQCB) can be observed since Q1 2018 (see Figure 3). Before that period, the unwinding produced a decrease in the amount of Level 1 assets excluding EHQCB. It is worth remembering that, in Q3 2017, the ECB conducted a longer-term refinancing operation to provide additional, longer-term refinancing to the financial sector.

*Figure 3: Aggregate level effect of the unwinding of short-term (< 30 days) operations on the L1 excluding EHQCB assets, December 2019*




At country level, as of the end of December 2019, the amount of Level 1 assets excluding EHQCB decreases only in three countries after the application of the unwind mechanism (see Table 9).

*Table 9: Country-level effect of the unwinding of short-term (< 30 days) operations on the L1 excluding EHQCB assets*

| Country | 2017-7 | 2017-12 | 2018-12 | 2019-12 | 2020-3 |
|---|---|---|---|---|---|
| **All** | **-86.2** | **-30.9** | **104.5** | **87.5** | **125.5** |
| AT | 5.3 | 3.0 | 3.1 | 7.7 | 5.9 |
| BE | -17.4 | -16.0 | 1.5 | 2.2 | 0.1 |
| BG | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| CY | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 |
| DE | 7.9 | 5.6 | 16.6 | 13.2 | 6.0 |
| DK | -6.5 | -8.4 | -1.5 | 13.7 | 4.2 |
| EE | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ES | -15.3 | -29.6 | -9.5 | -17.6 | -16.4 |
| FI | 0.0 | 0.0 | 18.9 | 20.7 | 30.5 |
| FR | -74.2 | -12.5 | 34.8 | -1.8 | 48.0 |
| GR | -37.1 | -27.5 | -7.2 | 1.5 | 2.3 |
| HU | 0.0 | 0.0 | 0.0 | -0.4 | -0.8 |

| | | | | | |
|---|---|---|---|---|---|
| **IE** | -0.7 | -0.1 | 1.9 | 1.8 | 1.1 |
| **IS** | . | . | 0.0 | 0.0 | 0.0 |
| **IT** | 4.7 | 4.8 | 8.2 | 1.4 | 3.8 |
| **LT** | . | . | 0.0 | 0.0 | 0.0 |
| **LU** | 0.6 | 0.5 | 0.8 | 1.0 | 0.4 |
| **LV** | 0.0 | 0.0 | . | 0.0 | 0.0 |
| **MT** | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 |
| **NL** | 10.6 | 25.1 | 22.2 | 28.1 | 20.5 |
| **NO** | 4.9 | 5.7 | 2.9 | 0.8 | 3.8 |
| **PL** | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 |
| **PT** | 0.2 | 0.0 | 0.3 | 0.3 | 0.3 |
| **RO** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **SE** | 30.7 | 18.3 | 11.5 | 15.0 | 15.9 |
| **SI** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Even if the unwind mechanism can have an effect on the quantification of the amount of Level 1 assets, it does not necessarily have an effect on the level of the LCR. Indeed, at aggregate level, the effect of the unwind mechanism on the LCR is insignificant along the entire period considered. For only one country is it possible to observe a negative impact of the unwind mechanism on the LCR but only up to the end of 2017. Table 10 shows the impact of the unwind mechanism on the LCR at bank level.

*Table 10: Effect of the unwind mechanism on the LCR at bank level*

| Date | Unwind mechanism effect | | |
|---|---|---|---|
| | LCR ↑ | LCR = | LCR ↓ |
| **31.7.2017** | 3 | 108 | 5 |
| **31.12.2017** | 1 | 109 | 4 |
| **31.12.2018** | 1 | 114 | 2 |
| **31.12.2019** | 3 | 113 | 1 |
| **31.3.2020** | 2 | 114 | 0 |

Table 11 provides the details, at bank level, of the cases in which the unwind mechanism caused a reduction in the LCR. In some of these cases, the effect of the unwind mechanism is not such as to reduce the LCR below the minimum. In the other cases (concentred in one country), the LCR is below the minimum both with and without the application of the unwind mechanism. It is possible then to affirm that, also in the observed cases in which the unwind mechanism produced a reduction in the LCR, the effect was insignificant from a practical point of view.

*Table 11: Details of the cases in which the unwind mechanism produced a reduction in the LCR*

| Date | L1 unadjusted, bln | L1 adjusted, bln | LCR (%) | LCR no unwind (%) |
|---|---|---|---|---|
| 31.7.2017 | 13.2 | 7.1 | 111.27 | 117.56 |
| | 0.7 | -10.7 | 0.00 | 21.67 |
| | 0.9 | -2.6 | 0.00 | 14.60 |
| | 0.9 | -9.0 | 0.00 | 18.16 |
| | 1.7 | -10.7 | 0.00 | 27.70 |
| 31.12.2017 | 23.3 | 19.1 | 152.53 | 154.76 |
| | 0.8 | -8.2 | 0.00 | 17.58 |
| | 1.0 | -6.1 | 0.00 | 15.33 |
| | 1.7 | -8.6 | 0.00 | 27.18 |
| 31.12.2018 | 1.3 | -1.3 | 0.00 | 22.80 |
| | 1.7 | -1.0 | 0.00 | 22.43 |
| 31.12.2019 | 16.2 | 13.2 | 170.59 | 184.22 |

Overall, the empirical evidence does not support the hypothesis that the unwind mechanism has a detrimental impact on the business and risk profile of credit institutions. Rather, current reporting data indicate that a positive impact can be observed at least on the amount of Level 1 assets excluding EHQCB, but this effect is not transmitted to the LCR, which is usually not affected at all by the unwind mechanism. With the specific impact of the unwind mechanism on the LCR being practically null, it is also not possible to affirm that it could have an effect on the stability and orderly functioning of financial markets.

## 4.3 Transmission of monetary policy

As regards the transmission of the monetary policy, the starting point of the analysis is the amount of reserves held by the credit institutions included in the sample (about EUR 1 400 billion); the LCR is then computed after the amount of the reserves is reduced. For example, with a 90% reduction (from EUR 1 400 billion to EUR 140 billion), it is possible to observe a relevant reduction in the LCR (on average from 146.4% to 95%); however, the LCR does not vary at all as a consequence of the application of the unwind mechanism. This implies that the unwind mechanism does not have the effect of amplifying the changes (even the extreme ones such as the one simulated) in monetary policy.

In Tables 12 and 13, a comparison can be seen between the actual data at aggregate level in December 2019 and the simulation in which a reduction in the reserves is assumed. The effect on the LCR of the unwind mechanism is null, and, in particular, the excess liquid amount is always null.

*Table 12: Effect at the aggregate level of the unwind mechanism under the hypothesis of reserves reduction, December 2019*

Actual data

| | **Net Outflow** | **2,451.9** |
|---|---|---|
| $a^0$ | L1 excl. EHQCB unadjusted | 3,187.3 |
| | cash | 97.9 |
| | **reserves** | **1,382.6** |
| | central gov assets | 1,184.0 |
| | other | 522.8 |
| a | L1 excl. EHQCB adjusted | 3,274.8 |
| | unwind effect | 87.5 |
| $b^0$ | L1 EHQCB unadjusted | 249.6 |
| b | L1 EHQCB adjusted | 236.6 |
| | unwind effect | -13.0 |
| $c^0$ | L2A unadjusted | 103.5 |
| c | L2A adjusted | 107.1 |
| | unwind effect | 3.7 |
| $d^0$ | L2B unadjusted | 79.6 |
| d | L2B adjusted | 80.9 |
| | unwind effect | 1.3 |
| | **with the unwind mech** | |
| | Excess Liquid Amount | 0.0 |
| | **Liquid Buffer** | **3,619.9** |
| | LCR | 147.64% |
| | **without the unwind mech** | |
| | Excess Liquid Amount | 0.0 |
| | **Liquid Buffer** | **3,619.9** |
| | LCR | 147.64% |

Reserves reduction

| | **Net Outflow** | **2,451.9** |
|---|---|---|
| $a^0$ | L1 excl. EHQCB unadjusted | 1,943.0 |
| | cash | 97.9 |
| | **reserves** | **138.3** |
| | central gov assets | 1,184.0 |
| | other | 522.8 |
| a | L1 excl. EHQCB adjusted | 2,030.5 |
| | unwind effect | 87.5 |
| $b^0$ | L1 EHQCB unadjusted | 249.6 |
| b | L1 EHQCB adjusted | 236.6 |
| | unwind effect | -13.0 |
| $c^0$ | L2A unadjusted | 103.5 |
| c | L2A adjusted | 107.1 |
| | unwind effect | 3.7 |
| $d^0$ | L2B unadjusted | 79.6 |
| d | L2B adjusted | 80.9 |
| | unwind effect | 1.3 |
| | **with the unwind mech** | |
| | Excess Liquid Amount | 0.0 |
| | **Liquid Buffer** | **2,375.6** |
| | LCR | 96.89% |
| | **without the unwind mech** | |
| | Excess Liquid Amount | 0.0 |
| | **Liquid Buffer** | **2,375.6** |
| | LCR | 96.89% |

Also at country level (see the table below), in most of the cases the reduction in the reserves does not bring out a specific effect on the LCR due to the unwind mechanism. The only exception is Denmark, where the LCR would, on average, be lower without the unwind mechanism.

*Table 13: Effect at country level of the unwind mechanism under the hypothesis of reserves reduction (%), December 2019*

| Country | LCR | LCR with 90% reserves cut | LCR with 90% reserves cut and no unwind |
|---|---|---|---|
| **AT** | 142.96 | 111.98 | 111.98 |
| **BE** | 151.77 | 120.12 | 120.12 |
| **BG** | 221.64 | 81.24 | 81.24 |
| **CY** | 316.57 | 131.09 | 131.09 |
| **DE** | 149.31 | 89.60 | 89.60 |
| **DK** | 179.62 | 154.43 | 133.66 |
| **EE** | 148.01 | 27.38 | 27.38 |
| **ES** | 157.74 | 114.26 | 114.26 |
| **FI** | 167.32 | 114.16 | 114.16 |
| **FR** | 133.06 | 71.65 | 71.65 |
| **GR** | 130.80 | 99.39 | 99.39 |
| **HU** | 166.72 | 146.31 | 146.31 |
| **IE** | 154.68 | 89.25 | 89.25 |
| **IS** | 162.58 | 150.60 | 150.60 |
| **IT** | 148.41 | 117.98 | 117.98 |
| **LT** | 206.13 | 177.33 | 177.33 |
| **LU** | 139.19 | 68.48 | 68.48 |
| **LV** | 357.59 | 221.80 | 221.80 |
| **MT** | 530.24 | 214.56 | 214.56 |
| **NL** | 131.05 | 91.68 | 91.68 |
| **NO** | 147.71 | 94.51 | 94.51 |
| **PL** | 146.32 | 142.04 | 142.04 |
| **PT** | 239.66 | 192.13 | 192.13 |
| **RO** | 689.86 | 659.05 | 659.05 |
| **SE** | 185.46 | 108.57 | 108.57 |
| **SI** | 355.06 | 252.26 | 252.26 |

## 4.4 Alternatives

It has already been shown in Section 4.1 (see Table 8) that setting a floor of zero to the L1 amount obtained after the application of the unwind mechanism does not produce any meaningful effect. Two other possible alternatives are explored in this section: the full alignment of the unwind mechanism to the Basel LCR standards and a simple comparison between the LCR computed with and without the unwind mechanism, with the intention of taking the lower of the two.

In the Basel LCR standards (paragraph 48), it is said that credit institutions must unwind operations involving an exchange of HQLA on both legs. This means that operations involving an exchange of HQLA for non-liquid assets should not enter into the unwind mechanism. The rationale for this is that it is expected that only the central bank would be available to accept non-liquid assets as collateral and that this kind of operation would be rolled over in the event of stress.

In contrast, the LCR DR requires the unwinding of all operations involving HQLA on at least one leg of the transaction. This is more restrictive, because it also requires the unwinding of repos and reverse repos backed by non-liquid assets, as well as collateral swaps involving an exchange of HQLA for non-HQLA. By exploiting the information of the supervisory reporting templates, it is possible to evaluate the impact of aligning the unwind mechanism with the Basel LCR standards. We verified that, for the entire period considered, the impact of changing the unwind mechanism would be immaterial for practically all credit institutions.

It has been proved in Section 2.1 (see Table 3) that, in the event of reverse repo operations, the effect of the unwind mechanism could be an increase in the amount of Level 1 assets. This is exactly the situation encountered in the actual data at aggregate level: Figure 3 shows that, since the beginning of 2018 and at aggregate level, the unwind mechanism results in an increase in the adjusted amount of Level 1 assets.

In Table 14, the credit institutions included in the sample have been classified on the ground of the effect of the unwind mechanism on the amount of Level 1 assets. In the event of a reverse repo, the effect is an increase in the amount of Level 1 assets and then an increase in the LCR. It is possible to see that the effect is material, even if it is not very important. Table 15 provides the details at bank level of the cases of reverse repo in which the unwind mechanism causes a significant effect on the LCR. It can be noted that the impact can be relevant but that these credit institutions also have a quite high LCR level without the unwind mechanism, which implies that the credit institutions have an excess of liquidity.

*Table 14: Impact of the unwind mechanism in the event of reverse repo*

| | L1 adj < L1 unadj Repo | | | | L1 adj > L1 unadj reverse repo | | | |
|---|---|---|---|---|---|---|---|---|
| | **Banks** | **LCR** | **LCR no unwind** | **Diff** | **Banks** | **LCR** | **LCR no unwind** | **Diff** |
| **31/12/2017** | 75 | 146.93% | 147.25% | 0.32% | 39 | 141.93% | 141.75% | -0.18% |
| **31/12/2018** | 68 | 150.48% | 150.85% | 0.37% | 49 | 141.81% | 141.60% | -0.21% |
| **31/12/2019** | 65 | 150.08% | 150.25% | 0.17% | 52 | 145.77% | 145.28% | -0.49% |
| **31/03/2020** | 65 | 152.33% | 152.33% | 0.00% | 51 | 143.34% | 143.08% | -0.26% |

*Table 15: Details of the impact of the unwind mechanism in the event of reverse repo*

| Date | Difference between L1 adjusted and L1 unadjusted, bln | LCR (%) | LCR no unwind (%) | Difference (%) |
|---|---|---|---|---|
| 31.12.2017 | 1.29 | 383.49 | 322.79 | -60.70 |
| 31.12.2018 | 2.40 | 218.97 | 140.07 | -78.90 |
| | 0.00 | 175.51 | 175.50 | -0.01 |
| 31.12.2019 | 0.51 | 174.10 | 115.04 | -59.06 |
| | 3.87 | 253.09 | 159.42 | -93.68 |
| | 0.89 | 158.04 | 144.01 | -14.03 |
| 31.3.2020 | 0.92 | 198.53 | 148.63 | -49.90 |
| | 2.20 | 385.72 | 307.41 | -78.31 |

# 5. Conclusions

The role of the unwind mechanism in the framework of the LCR has been discussed. It has been argued that the motivation for this adjustment is in line with the general aim of the LCR, that is, to reduce the dependence of credit institutions on short-term financing transactions and central bank liquidity provision. It has been shown, with theoretical examples, that, in the absence of the unwind mechanism, it would be possible for institutions to improve the amount of HQLA (and potentially the LCR) by borrowing liquid assets through short-term repos, in particular when transactions are undertaken with the domestic central bank.

The case of reverse repo operations has been studied, showing that, theoretically, in this case the unwind mechanism may produce an increase in the amount of HQLA that might not be justified from a prudential point of view. For this reason, it could be helpful to include in the regulation the systematic comparison between the amount of HQLA with application of the unwind mechanism and the amount of HQLA without, in order to take the lower one. However, it has been empirically shown that the materiality of these situations is currently limited.

In the observed period and with the available sample of credit institutions, it was not possible to detect detrimental impacts on the stability of the institutions. In aggregate terms, it was possible to find that the unwind mechanism has an effect on only the determination of the amount of Level 1 assets, and this effect is positive, whereas the effect on the LCR is null. A few cases were detected in which the unwind mechanism caused a reduction in the LCR, but the effect was not economically meaningful in any of them. The waiver introduced in Delegated Regulation (EU) 2015/61 should provide sufficient flexibility to deal with such situations.

The empirical analysis conducted takes into consideration a period (end of 2016 to mid-2020) in which a significant shock occurred, i.e. the COVID-19 emergency. In particular, mid-2017 to the end of 2019 was a period in which the banking system conditions were steadily improving after a long stressed time period, and the reliance on central bank funding was becoming gradually smaller and more related to long-term refinancing operations (i.e. TLTRO and LTROs). For this reason, it could be helpful to extend the analysis by including the next years. It also worth mentioning that, at the end of 2020, through the Euclid project (see EBA/DC/2020/335) the EBA is going to receive data on regular basis, not only from a subset of banks but from all the EU banks. This represents a significant enlargement of data availability, and, from a qualitative point of view, this would enable smaller and local banks to also be included in the analysis. This is an additional reason to extend the analysis conducted in this report in the next years. The annual *EBA Report on Liquidity Measures Under Article 509(1) of the CRR* could host such an analysis.

# 6. Annex

The next two tables present a somewhat sophisticated example of an operation involving a reverse repo. The reverse repo transaction is combined with a sell of an illiquid asset. The first table presents the baseline situation in which the LCR is lower than 100%. Notice that the ELAA is equal to the non-HQLA amount.

| | Base line | | Pre-Haircut | | | Haircut | After-Haircut | |
|---|---|---|---|---|---|---|---|---|
| | HQLA Category | | Pre Repo | Repo Amount | After repo | | Unadjusted | Adjusted |
| | a | L1 excl. EHQCB | 75.0 | 0.0 | 75.0 | 0% | 75.0 | 75.0 |
| | b | L1 EHQCB | 250.0 | 0.0 | 250.0 | 7% | 232.5 | 232.5 |
| | c | L2A | 50.0 | 0.0 | 50.0 | 15% | 42.5 | 42.5 |
| | d | L2B | 0.0 | 0.0 | 0.0 | 50% | 0.0 | 0.0 |
| | e | Non-HQLA | 100.0 | 0.0 | 100.0 | 100% | | |
| | | sum a:d | 375.0 | | 375.0 | | 350.0 | 350.0 |
| with the unwind mechanism | Excess Liquidity Amount = $= (a_A+b_A+c_A+d_A) - \min[ (a_A+b_A+c_A+d_A) ; a_A*100/30 ; (a_A+b_A)*100/60 ; (a_A+b_A+c_A)*100/85 ] =$ | | | | | | | |
| | = | 100.0 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **250.0** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **83.3%** | | | | | | |
| without the unwind mechanism | Excess Liquidity Amount = $= (a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; a_U*100/30 ; (a_U+b_U)*100/60 ; (a_U+b_U+c_U)*100/85 ]$ | | | | | | | |
| | = | 100.0 | | | | | | |
| | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | = | **250.0** | | | | | | |
| | Net Outflows = | **300.0** | | | | | | |
| | LCR = | **83.3%** | | | | | | |

The second table represents a situation in which the institution sells non-HQLA and uses the cash received in a reverse repo. It is essentially a sale-and-lease-back structure, which changes the formal ownership but not the liquidity risk profile. In this case, after the operation, the amount of liquid assets is unchanged in comparison with the initial situation. However, due to the unwinding, the cash amount is considered as if it were at hand. The LCR is now higher than 100%. In practice, through this operation, it was possible to circumvent the calculation of the caps. Notice, however, that, in this example, any effect on the net outflows amount is not considered.

| | | sale of non-liquid assets and reverse repo | Pre-Haircut | | | | Haircut | After-Haircut | |
|---|---|---|---|---|---|---|---|---|---|
| | | HQLA Category | Pre Repo | Sale of non-HQLA | Repo Amount | After repo | | Unadjusted | Adjusted |
| | a | L1 excl. EHQCB | 75.0 | 100.0 | -100.0 | 75.0 | 0% | 75.0 | 175.0 |
| | b | L1 EHQCB | 250.0 | | 0.0 | 250.0 | 7% | 232.5 | 232.5 |
| | c | L2A | 50.0 | | 0.0 | 50.0 | 15% | 42.5 | 42.5 |
| | d | L2B | 0.0 | | 0.0 | 0.0 | 50% | 0.0 | 0.0 |
| | e | Non-HQLA | 100.0 | -100.0 | 100.0 | 100.0 | 100% | 0.0 | 0.0 |
| | | Sum a:d | 375.0 | | | 375.0 | | 350.0 | 450.0 |
| with the unwind mechanism | | Excess Liquidity Amount = $= (a_A+b_A+c_A+d_A) - \min[ (a_A+b_A+c_A+d_A) ; a_A*100/30 ; (a_A+b_A)*100/60 ; (a_A+b_A+c_A)*100/85 ] =$ | | | | | | | |
| | | = | 0.0 | | | | | | |
| | | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | | = | **350.0** | | | | | | |
| | | Net Outflows = | **300.0** | | | | | | |
| | | LCR = | **116.7%** | | | | | | |
| without the unwind mechanism | | Excess Liquidity Amount = $= (a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; a_U*100/30 ; (a_U+b_U)*100/60 ; (a_U+b_U+c_U)*100/85 ] =$ | | | | | | | |
| | | = | 100.0 | | | | | | |
| | | Liquidity Buffer = | $(a_U+b_U+c_U+d_U) - \min[ (a_U+b_U+c_U+d_U) ; \text{Excess LA} ] =$ | | | | | | |
| | | = | **250.0** | | | | | | |
| | | Net Outflows = | **300.0** | | | | | | |
| | | LCR = | **83.3%** | | | | | | |

# Bibliography

Bech, M. and Keister, T., 2012, 'On the liquidity coverage ratio and monetary policy implementation', *BIS Quarterly Review*, December 2012.

Cetina, J., 2015, 'The difficult business of measuring banks' liquidity: understanding the liquidity coverage ratio', Office of Financial Research Working Paper, Office of Financial Research, US Department of the Treasury, Washington, DC, United States.

Curfman J. and Kandrac J., 2019, 'The costs and benefits of liquidity regulations: lessons from an idle monetary policy tool', Finance and Economics Discussion Series Working Paper No 2019-041, Board of Governors of the Federal Reserve System, Washington, DC, United States.

Gorton B. G., Metrick A., '*Securitized banking and the run on repo'*, NBER Working Paper 15223

Roberts D., Sarkar, A. and Shachar, O., 2019, *Bank Liquidity Creation, Systemic Risk and Basel Liquidity Regulations,* Staff Reports 852, Federal Reserve Bank of New York, New York, United States.

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