

17 March 2009

Interim Report on Liquidity Buffers & Survival Periods

TABLE OF CONTENTS

<i>Executive summary</i>	3
<i>Introduction</i>	4
<i>Background</i>	4
1. Definition of liquidity buffer and survival period	6
1.1 Counterbalancing Capacity	6
1.2 Liquidity buffers.....	8
2. What are the assumptions that drive the amount of liquidity in the buffer?	9
2.1 General principles for a supervisory approach	9
2.2 Types of stresses to be considered.....	10
2.3 Time horizons to be considered.....	11
2.4 Related behavioural assumptions	11
3. What assets should be included in the buffer?	12
<i>Conclusion</i>	12
<i>Appendix</i>	14

Executive summary

1. The thinking on what a liquidity buffer is, and what its appropriate size and composition should be, varies. It is safe to say that there are a range of liquidity buffer approaches to be found in the industry and in the different regulatory regimes. Any approach applied is greatly influenced by the liquidity management strategy, the business model and complexity of the bank and its risk tolerance. It is clearly evident though from the recent financial turmoil that banks need to hold a liquidity buffer. The more liquidity risk a bank runs, the larger its buffer should be.
2. In general this leads to a differentiation by maturity buckets/time horizons in the composition of a liquidity buffer. In some cases, as intra-day calls on liquidity from payment and settlement systems have proven to be an important issue, banks are explicitly assigning parts of their liquidity buffer for meeting these needs. In most instances, further differentiation needs to be made around legal entities and currencies.
3. A liquidity buffer can therefore be regarded as the short end of the counterbalancing capacity under a "Planned Stress" view. It needs to be available outright over a defined short period of time (the 'survival period') during which it can be drawn on without needing to make any adjustments to the business or drawing on additional funding sources.
4. The liquidity buffer is dependant on three dimensions, the severity and characteristics of the stress scenarios, the time horizon fixed as the survival period and the characteristics of the assets in the buffer. The paper proposes a framework for conducting these stress tests and also tentatively suggests a survival period of one month. Further work will aim at developing an approach to setting a common set of assumptions which supervisors think are appropriate to be incorporated in stress scenarios to be utilized by the banks, while strictly respecting the proportionality principle.
5. Principles for setting the adequate minimum size of the buffer, especially in relation to survival periods, will also be prepared by CEBS in its further work. This should not preclude banks from defining other internal survival horizons according to their complexity, business model and liquidity profile in order to plan effectively for their 'survival'.
6. The paper concludes with recommendations on which assets should be included in the buffer. It emphasizes that over-reliance on central banks' funding in stress scenarios must be avoided. Liquidity buffers must however be built up from assets that ensure generation of liquidity within a short time. The proposal is that liquid marketable assets should form the core of the buffer. Further work will also aim at agreeing and defining principles for the determination of eligible assets.
7. Overall, preference is expressed by CEBS members and the industry representatives involved for a rather simple supervisory approach which will facilitate implementation as well as communication with stakeholders.
8. This simple approach would need to be complemented by on-going dialogue between institutions and their supervisors since several drivers of the liquidity

buffers are depended on an institution's business model, as is the case for instance with the time needed to make adjustments to the model.

Introduction

9. In September 2008 CEBS published the second part of its Advice to the Commission on liquidity risk management, including 30 Recommendations¹. In October 2008, the Committee decided to provide follow-up guidance while allowing for the prioritization of topics to be addressed, leading to sequential deliverables over 2009-2010.
10. This prioritization exercise has been greatly influenced by the G20 Declaration and Action plan of 15 November 2008, following which the Economic and Financial Committee of the European Council requested EU regulators to "Develop and implement procedures to ensure that financial firms implement policies to better manage liquidity risk, including by creating strong liquidity cushions".
11. This interim report provides a follow-up to Recommendation 16 and is therefore concentrating on liquidity buffers and their related survival periods. It presents the Committee's preliminary thinking on how authorities could intervene to steer the approach the industry will use. To this end the report attempts to uncover commonalities and key drivers in relation to liquidity buffers observed in the industry and then, bearing in mind potential restrictions, to point the way towards influencing these drivers, which will determine the amount and composition of liquidity buffers over predefined time horizons.
12. For this, it will make use of previous work and of the input received from CEBS's Industry Expert Group on Liquidity (IEGL)², through a stock-taking exercise and joint meetings with the CEBS Task Force on Liquidity Risk Management. This industry input is presented in the Appendix. The ideas presented in this interim report were explored with the IEGL and in their conceptual form agreed upon.
13. This report is not intended to provide an all-encompassing solution to the management of liquidity, liquidity risk and liquidity stresses, but only to provide an attempt at a solution to manage their 'front end'. It will be developed into a formal Consultation Paper by mid-2009.

Background

14. Overall reputational risk, direct interbank exposures, market liquidity in capital markets and disruptions in payment systems provide the channels for liquidity problems at an individual bank to spill over into market-wide disruption of liquidity (i.e., contagion effects). Individual banks generally do not take the effects of their potential liquidity problems on the money market into consideration when formulating their optimal liquidity management. This externality provides the major rationale for public intervention – whether this is liquidity regulation and supervision, reporting requirements or the lender of last resort function of central

¹ The Advice is published on the CEBS website and can be accessed at <http://www.cebs.org/Publications/Advice/2008/CEBS'S-TECHNICAL-ADVICE-ON-LIQUIDITY-RISK-MANAGEMENT.aspx>

² The List of Members of the Industry Expert group on Liquidity is available on the CEBS website at <http://www.cebs.org/Aboutus/Organisation/Consultative-Panel/Industry-expert-groups/Liquidity.aspx>

banks. A number of papers discuss private sector alternatives to public intervention but the current consensus is that some form of public intervention is required, especially in the presence of potential macro-shocks. This public intervention is in the interest of all banks and other stakeholders.

15. A common approach for measuring and managing liquidity risk is the use of cash-flow projections by mapping expected future cash inflows and outflows to maturity buckets and doing a liquidity gap analysis, while accounting for expected counterbalancing capacity in the business to fill those gaps. Counterbalancing capacity refers to the liquidity that a firm is expecting to be able to access over a given timeframe. The cumulative sum of all cash inflows comprises the liquidity available to cover liquidity outflows from on- and off-balance sheet positions. Liquidity risk should be managed in order to meet the net cumulative cash outflow within a certain time period, starting with one day and going out in time, after applying risk management techniques to reduce the net cumulative cash outflow and using the liquidity generation from the counterbalancing capacity of assets, liabilities, funding sources and other measures.

1. Definition of liquidity buffer and survival period

16. Most of the institutions under review set implicit or explicit limits on liquidity risk, taking into account some liquidity buffer, which allows them to be able to meet payments in stressed situations. CEBS has laid down the main principles underlying the function and composition of liquidity buffers in Recommendation 16 of its Advice on liquidity risk management. This conception is in line with the work of the Basel Committee on Banking Supervision³.

Recommendation 16 - Liquidity buffers are of utmost importance in time of stress, when an institution has an urgent need to raise liquidity within a short timeframe and normal funding sources are no longer available or do not provide enough liquidity. These buffers, composed of cash and other highly liquid unencumbered assets, should be sufficient to enable an institution to weather liquidity stress during its defined 'survival period' without requiring adjustments to its business model.

17. In order to derive a precise definition of a liquidity buffer and/or survival period, common conceptual understanding around cash flow projections and the determination of liquidity risk has to be introduced first. Whereas variations in applying this concept may exist in practice, the general concept remains true for all. Using this concept, we will then attempt the definition of a liquidity buffer and a survival period as a subset of overall liquidity and liquidity risk management.

1.1 Counterbalancing Capacity

18. Conceptually banks differentiate in their cash-flow projections between three main categories of flows. These categories can typically be labelled at their highest level of aggregation as expected cash inflows, expected cash outflows and expected counterbalancing capacity. Each of these categories can of course be broken down by source and tailored to the individual bank's needs. The flows associated with each of these categories are typically broken down by maturities into so-called maturity buckets.
19. It is important to distinguish between contractual and behavioural or, more accurately, deterministic and stochastic, flows. Indeed there could be a huge divergence (especially on the retail side) between what normally happens as a matter of day to day reality and what the contractual entitlements of the liability holders actually are. That is another reason why we will need to differentiate between business-as-usual and stressed conditions (cf. paragraphs 22 and 23).
20. For each maturity bucket expected inflows are determined and the expected outflows are subtracted from these. Whenever this leads to a funding gap, i.e. when outflows outweigh inflows in within a given time bucket, this gap needs to be filled by liquidity available through various funding sources. These funding sources are then generically referred to as counterbalancing capacity. In other words, the capacity to generate funds through various means, sources and actions in order to fill the funding gap between cash in- and outflows. Finally a cumulative view of these flows is provided to take into account carryovers from one period to the next and to give a view on the total balance between the flows and counterbalancing capacity over time.

³ Cf Principles for Sound Liquidity Risk Management and Supervision (September 2008), in particular Principle 12.

21.The example outline below illustrates this concept of cashflow projections:

Date	Currency					
Flow Type	Position/Souce	Up to 1 day	1 to 7 days	7 to 30 days	1 to 3 months	> 3 months
Cash Inflows						
	<i>Sum of cash inflows</i>					
Cash Outflows						
	<i>Sum of cash outflows</i>					
	<i>Net Funding Gap</i>					
	<i>Cumulated Funding Gap</i>					
Counterbalancing Capacity						
	<i>Sum of counterbalancing capacity</i>					
	<i>Cumulated counterbalancing capacity</i>					

22.The cashflow projections are made under business-as-usual assumptions for day-to-day liquidity management purposes. For liquidity risk management purposes, the same projections are then stressed under various scenarios. The number of scenarios, their granularity in terms of the business and the positions/sources vary with the level of complexity, the business model and the size of the individual institution. Overall though, all three categories of flow are stressed, namely the inflows, outflows and the counterbalancing capacity according to the relevant scenarios. The insights gained through this exercise should lead the bank to develop its liquidity risk management approach, including liquidity risk tolerance, funding strategy and contingency funding plans. The institution will, as a result, need to plan its liquidity generation capability, its liquidity holdings, its business strategy and its funding approach according to its risk tolerance.

23.Whereas cash in- and outflows are a function of the business strategy and the business model, etc. of the bank under normal circumstances, counterbalancing capacity can in essence be viewed as a derived plan to ensure the necessary funding to allow the execution of the planned business activity and strategy over a longer term. Similarly it would need to account for greater requirements for funding under stressed conditions, as well as a possible decrease in the value of these funds, and hence exceed normal levels. Also, the availability of certain funds, funding sources etc., which are part of the normally assumed counterbalancing capacity, cannot be guaranteed under all scenarios and alternatives have to be sought and planned for. This is the essence of a contingency funding plan.

24.In other words, the counterbalancing capacity is a plan to hold, or have access to, excess liquidity over and above a business-as-usual scenario over the short, medium- and long-term time horizons in response to stress scenarios as well as to plan for further liquidity generation capabilities, whether through tapping additional funding sources, making adjustments to the business or through other more fundamental measures. This second part is tackled through the establishment of contingency funding plans. Counterbalancing capacity therefore, as we will see, includes the liquidity buffer but is much wider in its definition.

25.Below is an illustration of these alternative views of Counterbalancing Capacity:

Counterbalancing Capacity under different views		Timeframe		
View	Definition	Short-term	Medium-term	Long-term
Business-as-Usual view	Projections according to business plan	Readily available funds to offset Business-as-Usual Net Funding Gap		
"Planned Stress" view	Projections according to stressed business plan under "Planned" scenarios	Readily available funds to offset Business-as-Usual Net Funding Gap + Planned additional funds to offset Incremental "Planned Stress" Net Funding Gap		
"Protracted Stress" view	Readying the business for "Protracted Stress" scenarios, more severe and/or longer stresses	Readily available funds to offset Business-as-Usual Net Funding Gap + Planned additional funds to offset Incremental "Planned Stress" Net Funding Gap + Other fund generation through Contingency Funding Plan to offset Incremental "Protracted Stress" Net Funding Gap		

1.2 Liquidity buffers

26. In this context, a liquidity buffer is the short end of the counterbalancing capacity.

It can be defined as the excess liquidity available outright to be used in liquidity stress situations within a given short-term period. In other words, it is liquidity available without any extraordinary measures needing to be taken. The size of this buffer is then determined according to the funding gap under stressed conditions over defined time horizons ("the survival periods").

27. The term 'survival period' is slightly misleading as it seems to imply that the supervisory focus is solely on the institution surviving for a defined period of time. In reality, in addition to the survival period, supervisors will focus on other measures taken to manage the net funding gap as well as the available funding and, as such, supervisory focus should be on the business surviving well beyond the stress period. Therefore a survival period has to be viewed as a time period during which a bank can continue operating without needing to generate additional funds and still meet all its payments due under the assumed stress scenarios.

28. An illustration of the Liquidity Buffer as a subset of Counterbalancing Capacity is set out below:

Liquidity Buffer as Subset of Counterbalancing Capacity		Timeframe		
View	Definition	Short-term	Medium-term	Long-term
Business-as-Usual view				
"Planned Stress" view	Projections according to stressed business plan under "Planned" scenarios	Readily available funds to offset Business-as-Usual Net Funding Gap + Planned additional funds to offset Incremental "Planned Stress" Net Funding Gap		
"Protracted Stress" view				

29. A liquidity buffer therefore is defined as the amount of liquidity which satisfies the following conditions:

- it represents the short end of the counterbalancing capacity under a "Planned Stress" view;
- it needs to cover the excess need for liquidity determined by the difference between stressed conditions and business-as-usual conditions over a defined short period of time (the 'survival period'); and
- it needs to be freely available in this short period, i.e. it can be drawn on without needing to make any adjustments to the business or drawing on additional funding sources within this period. In other words, the buffer needs

to be defined in terms of cash or assets which can be converted into cash available to the bank to make payments, and that conversion needs to be possible (a) promptly and (b) at predictable values.

30. The liquidity buffer is thus dependent on three dimensions, the severity and characteristics of the stress scenarios, the time horizon fixed as the survival period and the characteristics of the assets in the buffer.

31. The specification of the liquidity buffer (type and amount of assets) is driven by the following assumptions:

- which unexpected cash needs arising from potential bank-specific problems and potential systemic problems, as well as a combination of such stress scenarios, the buffer needs to meet; and
- the degree to which legal entities should be self-sufficient in terms of liquidity taking into account the intra-group dependencies and the extent to which liquidity should be allocated to different currencies because of potential disruptions in swap markets etc.

32. The next section will explore the determinants of the liquidity buffer and the duration of the survival period.

2. What are the assumptions that drive the amount of liquidity in the buffer?

2.1 General principles for a supervisory approach

33. Deriving from the three dimensions which a liquidity buffer is dependent on and its setting within the general liquidity risk management framework, what would a supervisory approach for banks' liquidity risk management in general, and liquidity buffer management in particular, ideally look like from an authority's perspective?

- Liquidity risk is largely institution specific. Any approach to banks' liquidity risk management should acknowledge that banks tailor their liquidity management, stress tests and liquidity reserves to their specific needs. This, however, does not preclude the approach from aiming to capture liquidity risk factors that are common to all banks.
- The combination of a tiered market structure and a concentration of activity implies that the potential severity of contagion is higher for money centre banks than for small banks at the fringe of the market. That provides a rationale for authorities to focus on the liquidity risk management, stress tests, liquidity buffers and contingency funding plans of money centre banks in particular and underlines the case for proportionality.
- Liquidity risk differs among credit institutions and the underlying risk should be properly reflected. This provides a rationale for a risk-based approach. The lender of last resort function of central banks is regarded as (implicit) insurance for banks and the money market against liquidity shocks that money market participants are unwilling to absorb (for example due to liquidity hoarding) or unable to absorb (i.e. macro-shocks such as the money market shock commencing on 9 August 2007). The value of this (implicit)

insurance increases with banks' exposure to liquidity risk, which increases moral hazard. The approach to banks' liquidity risk management and liquidity buffer management should be risk based; it should reflect the underlying risk exposure, not only for prudential reasons but also to limit moral hazard ex-ante before the onset of a crisis.

- Authorities need up-to-date information about banks' liquidity risk exposure and liquidity situation on an on-going basis. Liquidity requirements based on historic balance sheet positions or historic cashflows are of little use in this respect. Therefore, banks should make available to their authorities data based on forward-looking measures of liquidity risk exposure, liquidity buffers and counterbalancing capacity, i.e. liquidity stress test results (including the necessary background information).
- All materially relevant sources of liquidity risk should be included under any approach, irrespective of their nature as liabilities or assets, on-balance-sheet or off-balance-sheet, currency denomination etc.

2.2 Types of stresses to be considered

34. The calibration of the buffer will then, in the first dimension, depend on the assumptions used to define the stress conditions a bank should be able to withstand. Three fundamental types of stresses should be considered, an idiosyncratic stress, a market specific stress and a combination of both. This has the advantage of covering most possible types of scenarios a bank could face and of giving insights into the dynamics under each of these scenarios, allowing all stakeholders to be better prepared to face all eventualities. For example, the range of market wide scenarios is broad, and in at least some kinds of market-wide stresses the central bank may see its role and the way it gives access to its facilities rather differently to an idiosyncratic stress only affecting one bank. Therefore CEBS proposes that institutions should cover all three types and to broadly characterise them by some specific assumptions. Moreover, these stress scenarios should be consistent with other stress tests throughout the bank in order for the whole system of risk management to be consistent and integrated logically.

35. The idiosyncratic stress could typically be defined by a market loss of confidence in an individual bank, which would be equivalent to a multi-notch downgrade, ensuring the scenario chosen is severe enough to trigger liquidity relevant events. The market-wide stress could typically be defined as the simultaneous unavailability of several markets with widespread concerns about the solvency of financial sector firms and uncertainty about the value of financial assets. The combined scenario of course is a combination of both.

36. If a shock is idiosyncratic, it is likely to affect all the funding sources of the institution,, retail and wholesale, the institution being perceived by all to be in a deteriorating condition. Secured funding would potentially be less affected than unsecured funding since the quality of assets used to secure funds is unlikely to be correlated with the institution's condition. In that spirit, a plausible assumption would be to assume no rollover of unsecured wholesale funding in the acute phase of the stress.

37. Retail funding behaviour is linked to depositors' perception of the individual bank's probability of failure⁴. Therefore, it would be sensible to link assumptions about

⁴ Retail runs will also of course depend on the level and type of deposit insurance.

retail outflows to the soundness of the institution as perceived by the public. It is worth noting that a full scale retail run would ultimately result in the institution's failure and a buffer cannot be meant to withstand this extreme scenario. Assumptions for retail outflows should then assume severe outflows in the short term scenario, but those assumptions should then be less extreme for the longer term scenario since sustaining severe retail outflows for more than a week would not make survival probable: either the bank manages to restore confidence or it has to enter resolution. Regarding retail outflows, specific percentages could be proposed, subject to studying what has been observed for specific banks under stress in the current crisis.

38. In a market-wide shock, wholesale funding (unsecured and secured, if there is a general lack of trust in financial instruments used to secure funding) is likely to decline first and be most affected. The assumptions for wholesale funding outflows would be based on a gradual leakage of funds, with a reduction in the maturity profile of the funding available. There would also be significant potential liquidity requirements beyond their expected and historic levels from off-balance sheet contingent lines.

2.3 Time horizons to be considered

39. The time period considered, in the second dimension, can be described in two sequences: a short acute phase of stress (for instance up to one or two weeks) and then a longer time horizon of less acute but more persistent stress (for instance up to one month). This has the merit of looking at different levels of severity for the stress scenarios, linked to different ways to address the stress within the liquidity buffer. Beyond these time horizons, other measures would be considered such as CFP, activity adjustment, business model change, etc.

40. Keeping the survival periods relatively short seems necessary due to the difficulty of defining specific assumptions for longer time horizons: the static⁵ dimension of the liquidity buffer calibration cannot account for the changes that can occur in a bank's liquidity risk profile over a protracted period of stress. Also recent experience shows that confidence in an individual bank or in a given banking system can disappear rapidly.

2.4 Related behavioural assumptions

41. Having considered the different types of shocks and time horizons, one has to design one set of behavioural assumptions only for each time horizon. .

42. With regard to the assumptions defining the severity of the stress, CEBS would propose some common assumptions while leaving the details of calibration for inflows and outflows to a dialogue between the supervisor and the institution. This would strike a balance between being wholly prescriptive for the sake of simplicity and comparability, and leaving the definition of assumptions to banks for the sake of being accurate for each specific business model. A strong process for reviewing firms' assumptions, including supervisory pooling and reviewing banks' experiences during previous stress events should then be put in place.

⁵ Static here refers to assumptions of no change in the business model, funding strategy, or similar, and not to the modelling of the flows.

3. What assets should be included in the buffer?

43. The buffer should be mainly comprised of the most reliably liquid assets which they can sell or repo irrespective of their own condition (short of a complete loss of confidence) without accepting large 'fire sale' discounts which would further erode the market's confidence in them and generate mark-to-market losses for other banks holding similar instruments. (High-quality government bonds are the prime example of such instruments.)
44. While highly liquid marketable assets should constitute the core of the buffer, allowing it to cover the acute phase of stress, other assets could be included in the buffer which require a longer time to liquidate, and therefore would be available for the longer end of the survival period.
45. Moreover concentration of certain asset types may be problematic, as a market breakdown of these asset types could severely hit the institution's funding capacity.
46. Central bank eligibility may play a role in identifying the liquid assets composing the liquidity buffer, since central bank collateral lists are defined in normal times around marketability criteria, with haircuts being an indicator of their relative liquidity. However, banks must be realistic about what funding they could reliably get from the central banks. In addition, central bank eligibility should not be the only criterion for eligibility for inclusion in the buffer because of moral hazard issues: banks will tend to pledge their relatively illiquid assets at central banks, when eligible, in order to use their most liquid/marketable assets to extend their liquidity buffer as much as possible.
47. As assets should be liquid in most imaginable circumstances as well as possessing central bank eligibility, the question arises as to whether assets eligible at the central banks but not liquid in the market should be included in the buffer, and if so, to what extent.
48. Last, further work might be needed regarding specific cooperative banking groups' arrangements, in which the central institution plays a key role as liquidity provider.

Conclusion

49. This interim report focuses on the concept of a liquidity buffer as defined in CEBS's Advice on liquidity risk management. Drawing on commonalities within EU supervisors and within the industry, a generic approach that could be used in implementing a buffer has been developed.
50. The liquidity buffer is proposed as a short term counterbalancing capacity for stressed scenarios and as a stock of unencumbered assets that are available to meet gaps caused by liquidity shocks. To help calibrate the size of the buffer, cash outflows and inflows using the maturity mismatch approach should be stressed and the size of the resulting gap examined. In addition, a survival period is defined which is a period of time for which the buffer should be sufficient to ensure that liquidity needs are met.

51. The report proposes a preliminary framework for conducting these stress tests and also suggests as plausible a survival period of one month. Tentative recommendations are made on which assets should be included in the buffer, i.e. that liquid marketable assets should form the core of the buffer.
52. Further work will aim to develop an approach for setting a common set of assumptions which supervisors think appropriate to be incorporated into stress scenarios utilized by the banks while strictly respecting the proportionality principle. Principles for setting the minimum size of the buffer, in relation to different survival periods, will also be elaborated upon. Lastly, the next steps will also aim to agree and define principles for the determination of the assets eligible for liquidity buffers.
53. CEBS will continue its on-going cooperation with the industry during the course of its future work as appropriate. This supervisory initiative should not preclude banks from defining internal survival horizons according to their complexity, business model and liquidity profile to plan effectively for their 'survival'.

Appendix to Interim Report on Liquidity buffers & Survival periods

1. The outcome of a stocktaking exercise conducted at CEBS's Industry Expert Group on Liquidity is presented below. It builds on the answers and detailed presentations provided by 14 banks or banking associations⁶ as well as on two meetings held at CEBS's offices in February and March 2009. A range of the industry practices that have been reported is presented in the boxes.

I. What are the approaches to liquidity buffers found in the industry?

2. A common standard on measuring and managing liquidity risk has evolved among major banks in that they use cash flow projections by mapping cash inflows and cash outflows to maturity buckets and doing a liquidity gap analysis.
3. If there is a lot of agreement on how to measure liquidity risk, there is less consensus on what is the appropriate size and composition of a liquidity buffer. The thinking and approach to this issue varies and it is safe to say that there are a range of liquidity buffer approaches to be found in the industry.
4. The approach applied is greatly influenced by the liquidity management strategy and risk tolerance of the bank. If a bank is relying heavily on maturity transformation (i.e. it is funding long-term assets excessively from short-term volatile money market funding), it was clearly evident in the recent financial turmoil that such a strategy needs to be supported by an ample liquidity buffer. Banks with indications of significant liquidity risk hold higher buffers.
5. Banks also take into account how easily liquefiable a buffer of securities is under different market conditions. Banks are increasingly differentiating between unencumbered liquid assets that are readily marketable without loss or discount at all times and the time frame involved in the marketability of other assets.
6. Unencumbered liquid securities typically generate short-term liquidity inflows irrespective of their maturity. The reason is that secondary markets exist where securities can be sold or used as collateral for cash lending either in the market or with central banks. The depth of these secondary markets determines the liquidation horizon.
7. Commonalities exist amongst banks around the concept of differentiating by maturity buckets/time horizons in their liquidity buffers. According to criteria like issuer group, rating etc, securities are assigned to different liquidation horizons. Highly liquid bonds, like G7 Treasuries are in general assumed to be liquefiable overnight, whereas other securities can be liquidated within one week. More illiquid securities are assigned a longer liquidation horizon.

⁶ ALLIED IRISH BANK, BANK OF IRELAND, BNP PARIBAS, DANSKE BANK, DEXIA, DRESDNER BANK, DZ BANK, ERSTE BANK, GERMAN BANKS SAVINGS ASSOCIATION (DSGV), HSBC, INTESA SAN PAOLO, PROMETEIA, RZB, SOCIETE GENERALE.

Haircuts for future market value volatility and liquidation discounts are also considered.

8. Readily marketable securities are the most reliable source of stand-by liquidity because they can be sold outright or pledged to obtain secured funding. However, securities already pledged provide no stand-by liquidity at all. The liquidity from those securities has already been consumed by the bank. Intraday calls on liquidity from payment and settlement systems have become an important issue recently and banks are increasingly assigning parts of their liquidity buffer for these needs.
9. The composition of liquidity buffers (type and amount of assets) is driven by numerous assumptions. Stand-by liquidity must be adequate to cover unexpected cash needs arising from potential bank-specific problems and potential systemic problems as well as a combination of such stressed scenarios. Legal entities should be self sufficient in terms of liquidity. Liquidity should be allocated to different currencies because of potential disruptions in swap markets etc.

Range of industry practices for approaches to liquidity buffers:

- Within the industry, most banks either formally define a liquidity buffer or alternatively it is a concept implicit in their liquidity management policy.
- One institution formally defines its liquidity buffer as highly liquid unencumbered assets set at a level to get through the initial stages of a liquidity shock. It also defines a maximum amount of collateral that may be needed for intraday payment system purposes and deducts this from the stock of unencumbered assets. Buffers are formed for each of the currencies in which it is active. A survival period of 90 days is defined and liquidity shock scenarios developed to calibrate the size of the buffer.
- Another bank defines the buffer as a liquidity gap based on a run-off scenario (all maturing assets and liabilities not renewed during a 4 week period) that can be covered from high quality funding sources.
- Another bank defines the buffer over 30 days but does not use stress tests to measure the required size of buffer. Instead, expert judgement from the ALCO sets the buffer level. The quality of the assets in the buffer also impacts the level of buffer held.
- Another bank does not formally define a buffer. Instead it manages its overall counterbalancing capacity. As part of this, it uses projected flows to estimate a level of unencumbered assets that will cover the liquidity gap such that no change to the bank's business model is required. This output is an input to the overall policy on managing its counterbalancing capacity.

II. What maturity buckets can be used for which activity?

10. Maturity buckets cover periods from intraday to 3 and 6 months or even 1 to 2 years, but often liquidity buffers and counterbalancing capacity are blurred into each other. It is therefore not common to associate buffers with specific maturity buckets, but rather with the degree of liquidity of assets. Time horizons are often defined as limits to forward looking approaches under business as usual and stressed assumptions to determine overall buffer needs rather than specific distinctions of maturity buckets. Liquidity buffers are then

defined as a surplus of cash inflows (including assets that can be transformed into liquidity) over cash outflows over a certain time period or as an amount of liquidity available on top of liquid assets needed to satisfy current (normal) liquidity needs.

11. Maturity buckets can be defined for individual currencies, activities, etc. but the distinction by currency is the most common. Often this distinction is made purely to determine global liquidity needs across currencies rather than through holding liquidity in specific currencies
12. Maturity buckets reaching out to a period of 30 to 90 days are generally considered for the liquidity buffer or equivalent, and provide trigger points for medium-term or structural liquidity management. The time needed to transform assets into liquidity often determines a natural split between short-term, or buffer-type, views and approaches and more medium to long-term contingency-type approaches. Triggers are set by the time needed to transform certain assets into liquidity but also by the time needed to adjust activities or even the business model. These are reflected generally in contingency funding plans. On the other hand, intraday liquidity and collateral are mostly held and managed separately, ranging from complete explicit separation to more vague separate allocation/handling
13. Typically a limit system is used to manage liquidity within maturity buckets and/or across them. Intraday liquidity, where considered separately, is subject to separate limits. Moreover, subsidiaries are generally required to hold their own buffers, especially in local currencies, but longer term refinancing is generally done via the group. This approach has become more prominent after the crisis, as asset transferability and currency swap markets have been direly tested and found wanting. Again, the distinction is more time related, one could say survival period, than maturity bucket driven.
14. Limit systems vary in their form and application. Only sketchy information is available at this point, but limit systems can vary from ratio approaches over different time horizons/maturity buckets, to explicit detailed limit driven steering of funding and revenue generation. Limits can be set for all periods with no possibility to exceed the threshold at any time, or with the possibility of exceeding the threshold only for a number of days per period, for driving front-office activities through the allocation of liquidity costs, etc.

Range of industry practices for linkage between maturity buckets and liquidity buffer:

- The surveyed banks use different maturity buckets to assess and manage maturity mismatches on an on-going basis. For this purpose, buckets from one day to one week and then to one month are usually monitored closely. This means that more granular time buckets are considered for day-to-day liquidity management.
- In general, institutions do not seem to link the liquidity buffer (when it exists) to the different maturity buckets, considering when they might make use of it. But, while it has not been possible to ascertain common practices upfront, anecdotic evidence suggests that more sophisticated institutions relate their maturity buckets to liquidity buffers insofar as these are embedded in their scenario analysis.

III. What are the assumptions that drive the amount of liquidity in each bucket?

15. Genuine liquidity buffers are considered only for shorter time horizons; for the longer time horizons all balance sheet assets are taken into account when considering sources of liquidity. Liquidity buffers are then defined as a surplus of cash inflows (including assets that can be transformed into liquidity) over cash outflows over a certain time period or as an amount of liquidity available on top of liquid assets needed to satisfy current (normal) liquidity needs.
16. The liquidity to be held against each maturity bucket or across buckets, be it by currency, activity, etc. or across these and across maturities, is determined by cashflow projections. A major condition is often, that liquidity buffers must allow the bank to stay in the market and keep in the same position as it was before the start of the stress, there should be no significant change to the level of business.
17. As a tool for tackling stressed conditions, liquidity buffers must be strongly connected to the results of stress testing. Cashflow projections are stressed to arrive at desirable liquidity buffer/survival period levels. Stress scenarios impact both the liability side (increased deposit withdrawals and/or increased utilization of credit lines by clients or counterparties) and asset side (mainly decrease in cashflows from debt repayment). Virtually all stress scenarios these days take as a given, that the bank will have no access to unsecured inter-bank lending (this is true for both market-wide and name-specific crises). Scenarios that encompass longer periods take into account the evolution of the bank's business, which requires dynamic modelling.
18. Assumptions for stresses vary largely and are dependant on business type, complexity and activity or currency to some degree. The scenario design resulting from this is the key driver in forward looking cashflow assumptions under business as usual and stressed conditions. Furthermore, the eligibility of an asset for a liquidity buffer is driven by the stresses taken into account in the scenarios and their influence on individual buckets. Hence, the best lever for supervisors to steer liquidity buffers/survival periods is impacting both cashflow assumptions and scenario design.

Range of industry practices for assumptions driving the amount of liquidity in each bucket:

Industry practices are very diverse. Here are a few examples:

- The rationale for a liquidity buffer is that liquidity gaps can be covered by guaranteed funding sources. Guaranteed funding sources consist of (i) EUR govts, UST, Japanese govts + bilateral repo through Central Counterparty CCP (ii) repos with central banks or (iii) guaranteed unsecured funding from central banks (e.g. CPFF). In the base case scenario only part of these guaranteed funding sources can be used in the day-to-day management (cap). In the stress scenario all the guaranteed funding sources can be used.

- The primary liquidity reserve must be available at short notice. Hence, it is distributed within the very first buckets up to 1 month. For the rest of the unencumbered securities, distribution across the maturity buckets depends on the liquidity class of the asset considering the following parameters - type/structure, rating, listing, ECB-eligibility.
- Qualifying liquid assets must be saleable within 4 working days max and hence fall into this time bucket. Other contingent actions such as further asset sales (non-qualifying liquid assets) are factored into longer-term time buckets.
- The distribution of the buffer over the buckets is not defined by a statistical model but by assumption (judgemental) of the assets' financial features (e.g. tradability).
- Behavioural assumptions about cash flows and their timing are crucial. The assumptions about the possibility of rolling over maturing wholesale liabilities are very conservative, while a higher renewal rate of retail liabilities is envisaged.

IV. What types of assets/funding sources could be eligible for each time/activity bucket?

19. What is considered adequate liquidity to be held against different activities, currencies and/or time buckets varies to a certain degree. Liquid assets are not necessarily defined according to different activities, currencies and time buckets but rather with respect to normal vs. stress conditions. The level and type of stress will determine the size and composition of the buffer.
20. The type of liquid assets needs to be matched to the type of stress condition experienced in each time bucket. Banks generally distinguish between short-term and long-term stress conditions: short-term is generally covered by highly liquid assets typically defined by central bank (CB) eligibility. Banks also distinguish within CB eligible assets between the most liquid assets such as government bonds, and others whose liquidity value is primarily due to their being on the CB collateral list. Gaps identified under longer term stress will be covered by other marketable assets with appropriate estimates of time to liquidation, and haircuts. The composition of the buffer will generally remain the same over the different time periods in long-term stress, but the haircuts applied will be changed.
21. Cost-benefit calculations and risk appetite drive the choice of liquid assets in the buffer. Banks identify a trade-off between the liquidity value of the asset and its holding cost. Institutions surveyed usually express risk tolerance in terms of survival period. The length of the survival period is regularly adjusted by banks' management to reflect the risk tolerance of the organisation to changing market circumstances. Firms have generally increased the size of their buffer since the crisis started. The type of assets held in the buffer will influence the balance between public and private liquidity risk insurance: banks claim they do not expect public assistance in a liquidity crisis. However, liquidation of the buffer with the central bank is identified as one of the first lines of defence, which could indicate over-reliance on public liquidity risk insurance.

22. Volume, diversification aspects, currencies, maturity, market access, breadth and depth of markets are taken into account by banks when selecting assets for the buffer.

Range of industry practices for types of assets included in the liquidity buffers:

- For about one third of the respondents, eligibility for central bank transactions is the only criterion applied to assets that will comprise the liquidity buffer.
- When other criteria are applied to qualify for inclusion in the buffer, an asset must be:
 - either easily tradable, e.g. having a liquid and active market, although there is no common definition of active and liquid market that is applied to determine asset eligibility for liquidity buffers;
 - or accepted as collateral in an active repo market, although again, no common definition of this concept is applied; and
 - for about half of those banks, marketable/repoable assets constitute a major part of their liquidity buffers, all of these respondents being large banks. For another quarter of the respondents, a list of central bank eligible assets is the key determinant for setting liquidity buffers, again almost exclusively large banks. Direct access to central banks and/or repo markets may explain this difference.