

FINANCIAL SERVICES

Survey on Deposit Modelling

A global study of current practices



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Foreword

Dear readers,

The worldwide banking environment has been subject to significant change in the six years since the start of the financial crisis. As a consequence, national and international authorities have started to apply new approaches with regard to regulatory activities and among others banks' cost of liquidity has become an increasingly more important factor than previously was the case.

One of the most important sources to address funding needs have always been deposits. However, the impact of the financial crisis on liquidity and funding has intensified banks' motivation to tap into the long-term funding value of these shorter-term liabilities using behavioural modelling.

This effect has been boosted, due to the regulators' reaction to the financial crisis as witnessed by the Basel III Liquidity Coverage Ratio and Net Stable Funding Ratio. These Basel III regulations as well as their endorsement into EU law include favourable treatment for retail deposits. The overall importance of deposits as the most important funding sources for banks worldwide is ultimately reflected in banks' balance sheets. Currently, these provide roughly 41 per cent of funds for G-SIBs¹ in Europe, 46 per cent for G-SIBs in the USA and 60 per cent for G-SIBs in Asia.²

In view of these developments and the importance of deposits, we have conducted this survey of banks' attitudes toward deposit modelling with the intention of determining and characterizing best practices.

Primarily, the survey focused on four areas (governance, fund transfer pricing, customer pricing and deposit modelling) and banks' varying approaches to dealing with them.

In essence we found that in terms of the cost of liquidity, banks should have clear-cut answers to the following questions:

- Are risk and P&L roles and responsibilities defined appropriately in order to incentivize business desired by management?
- Are measurement and cost allocation consistent for enabling risk-based pricing?
- Are the internal liquidity costs/benefits sufficiently reflected in external pricing?
- Are the current modelling and cost/benefit allocation adequate with respect to the strategic importance of deposits?

Please note that the study is empirical in nature and analysed management practices. The information provided and explanations offered do not attempt to offer a complete picture or interpretation for deriving proper actions.

We would like to express our appreciation to all the participating banks and our individual contact persons. Your participation has allowed us to develop this snapshot of current behaviour regarding deposit modelling in banks around the world.

It is our hope that the Survey on Deposit Modelling serves as interesting and informative reading. We would be pleased to personally present you the results and welcome any questions or comments you may have.

Best regards,

Stefano Hartl
Dr. Arvind Sarin
Dr. Stefan Markwardt
Clemens Elgeti

1 The acronym G-SIBs refers to Global Systemically Important Banks as determined and published by the Financial Stability Board on a yearly basis.

2 Source: KPMG/own calculations based on annual reports 2012 or Q1 2013

Executive Summary

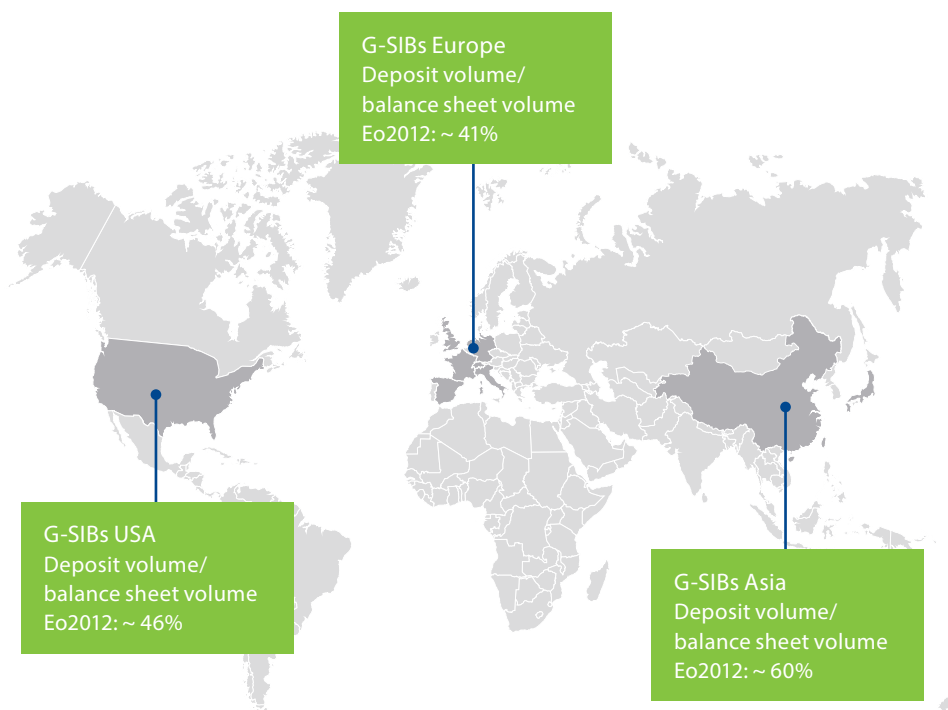
Surveyed institutions

We conducted our survey between August and October 2013. It is based on a total of 23 banks headquartered in the U.S., Europe and the Asia/Pacific regions.

The surveyed institutions represent a reasonable mix of:

- Large banks (i. e. balance sheet size above EUR 1000 billion³);
- Medium-sized banks (i. e. balance sheet size between EUR 500 billion* and EUR 1000 billion⁴); and
- Smaller-sized banks (i. e. balance sheet size below EUR 500 billion⁵).

Fig. 1 Importance of deposits as a source of funding for global systemically important banks



Source: KPMG

Most of the surveyed banks, and in particular the large ones, have global business activities. The smaller banks tend to have a focus on a single continent or region (Fig. 2).

Statistics shown within the survey are not broken down by the size of institutions, except where the survey results indicated that size is an influential factor for choice of practice. Most of the surveyed banks have a similar range of business activities. More volatile business activities, such as wholesale banking and investment banking, are represented, as is retail banking (Fig. 3).

Key findings

Governance

Amongst the banks surveyed, we found that the Risk function serves as a major player for measuring interest and liquidity risks while Finance assumes the key responsibility for covering cost/benefit allocation. The measurement and control of liquidity risks and interest rate risks are generally set up in an independent Risk function. Finance takes a strategic view of managing liquidity and therefore also oversees the liquidity cost/benefit allocation framework (LTP). Liquidity related profit and loss (P&L) generated is, however, typically not owned by Finance, but either allocated to a corporate centre or back to the business divisions. With regard to interest rate risk (IRR), the P&L is more commonly owned by a markets function, but again Finance is often a strong stakeholder from a strategic perspective.

³ Source: KPMG/own calculations based on annual reports 2012 or Q1 2013

⁴ *ibid.*

⁵ *ibid.*

Fund transfer pricing

There is a need to link the measurement of risks and cost/benefit allocation and to consider liquidity spread risks. Of the surveyed banks the best practice institutions link their liquidity risk measurement and control instruments with their LTP and are also interested in embedding liquidity spread risk into their LTP approach. Only about a third of the banks follow the better practice and consider both base and stress scenarios in their LTP approach. These banks typically run a transfer pricing system according to a base case, whereas stress cases are used to allocate liquidity reserve costs ex-post.

Customer pricing

Major challenges exist with regard to including liquidity costs/benefits in customer pricing. Most banks incorporate liquidity costs/benefits into their customer pricing. The majority of the banks do not manage to automatically feed these centrally calculated liquidity costs/benefits into their pricing tools. This is most likely due to technical constraints as well as the associated complexity and amount of effort.

Deposit modelling

The consistency between deposit models for liquidity risk management and LTP offer significant room for improvement. Banks are interested in increasing the consistency between their liquidity risk measurement and LTP. This trend is reflected in the application of common model frame-

works as well as a common database, but has not yet reached its end state. Deposits are modelled on a fairly high aggregation level and expert judgement is clearly a significant driver for the derivation of the model parameters. One reason for these model types is clearly that banks are mindful of costs and complexity.

Fig. 2 Size of surveyed institutions

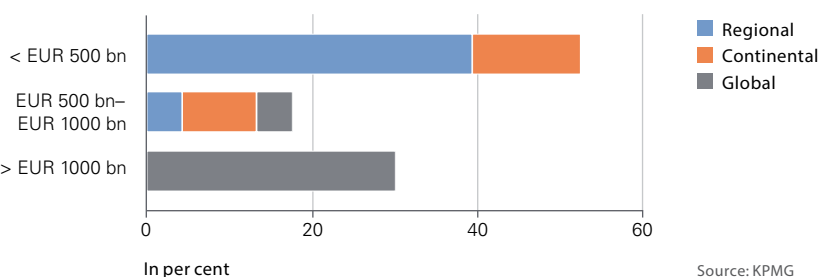
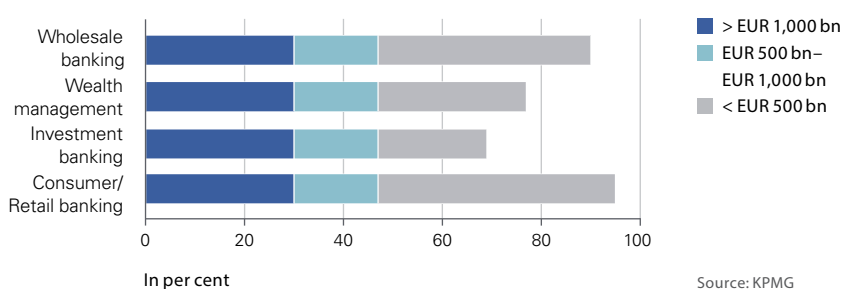


Fig. 3 Business activities of surveyed institutions



Key Findings

Governance

Governance establishes the foundation that provides the basis for conduct, performance and management. Proper governance induces the business desired by management and establishes the right incentives. Good governance provides for transparency and understanding for all stakeholders: e.g. management, investors and clients.

Definitions

Liquidity risk (LR)

Liquidity mismatch risk (LMR) is the risk that the bank might not be able to meet payment obligations as they come due. Payment obligations include expected and unexpected cash flow/collateral needs. Payment obligations must be met in full and on time without affecting either daily operations or the financial situation of the institution.

Liquidity spread risk (LSR) is the risk that the bank's profitability might be compromised, due to the fact that it is either only able to attract additional funds at increased liquidity spreads and/or it is only able to invest liquidity surpluses at lower profitability.

Liquidity cost/benefit allocation (LTP)

Approach and methodology to define, price and allocate liquidity costs and benefits within a bank. For the purposes of simplification in this study we have combined two approaches to liquidity cost/benefit allocation – simple pool approaches for cost allocation and liquidity transfer pricing – under this acronym.

Interest rate risk (IRR)

Interest rate risk is the risk that the bank's profitability might be compromised, either because the bank shows different interest rate tenors for assets and liabilities and/or different reference rates for assets and liabilities.

In general, banks differentiate between interest rate risk and liquidity risk management. Most banks link liquidity risk measurement and control models with their LTP (liquidity transfer pricing) framework (Fig. 4). Measurement and control of liquidity risk are typically set up in an independent risk function. Interest rate risk (IRR) is typically measured and controlled within this risk function. Finance often runs the liquidity cost/benefit allocation framework. However, the P&L generated is typically not owned by this function but attributed to a central cost centre or allocated back to business segments.

Management of liquidity risk

Increased focus on liquidity risk management

The global financial crisis quickly resulted in a growing interest in liquidity risk in general and in liquidity mismatch risk in particular. However, liquidity spread risk is also now coming into the focus. Despite the speed of change and the growing importance of liquidity spread risk, ca. 35 per cent of the surveyed banks do not explicitly consider it in their measurement and control framework (Fig. 5). A breakdown of the sample by size indicates that, in general, larger institutions are more likely to distinguish between liquidity mismatch risk and liquidity spread risk within the liquidity risk measurement and control framework.

Interaction of risk measurement and cost/benefit allocation

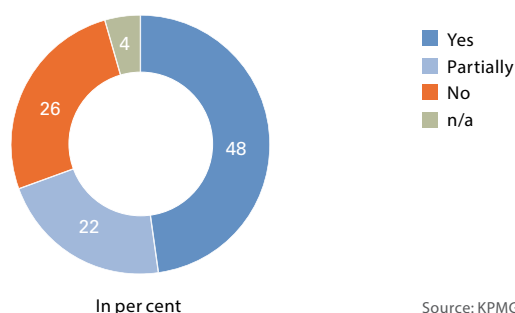
An efficient and effective liquidity management approach is defined by a strong interaction between different management processes. Large banks, as part of an effective liquidity management approach, are increasingly basing liquidity cost/benefit allocation on the models in place to measure liquidity risk. Although ca. 75 per cent of the surveyed institutions use the measurement models as direct, or at least partial, input for liquidity costs/benefits modelling, ca. 25 per cent do not consider their risk measurement models and are thereby potentially misaligning risk and the business. Larger banks have made significant progress in aligning liquidity risk measurement and costs/benefits allocation, and they tend to use the same models more often than smaller banks.

Management of interest rate risk

The interest rate risk management in the surveyed banks is typically much more developed than the younger liquidity risk management structures.

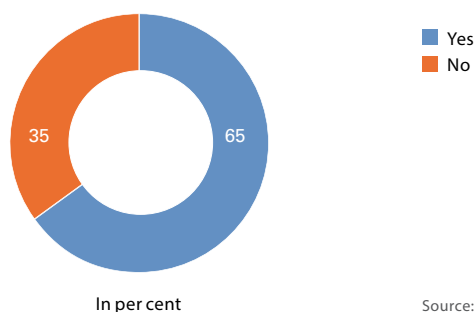
Compared to liquidity risk management more surveyed banks (ca. 95 per cent) have placed their IRR measurement and control function within Risk and/or Finance (Fig. 6).

Fig. 4 Banks where LR measurement and control models also act as a basis for liquidity cost/benefit allocation



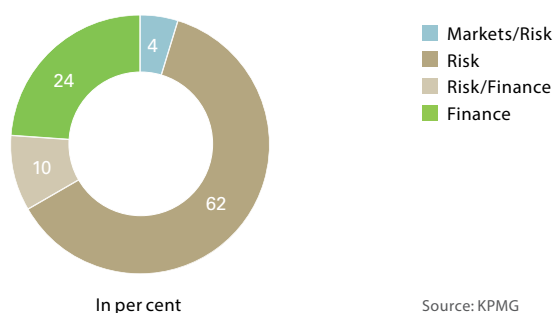
Source: KPMG

Fig. 5 Institutions distinguishing between liquidity mismatch risk and liquidity spread risk within their framework of measurement and control of liquidity risk



Source: KPMG

Fig. 6 Area/Department responsible for Measurement & Control of IRR



Source: KPMG

Key Findings

Fig. 7 Area/Department responsible for measuring & controlling liquidity risk (LR)

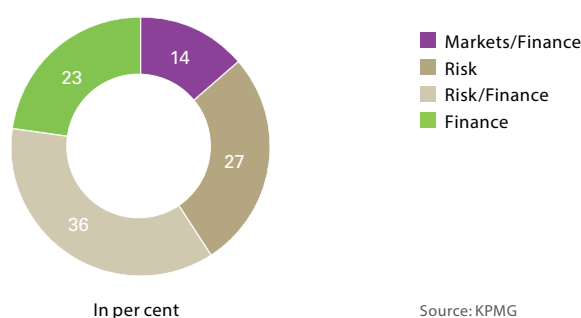


Fig. 8 Area/Department responsible for LR cost/benefit allocation methodology

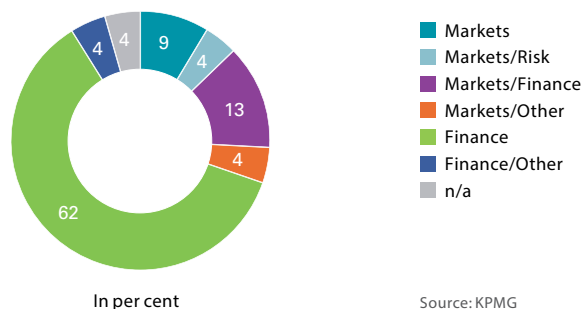
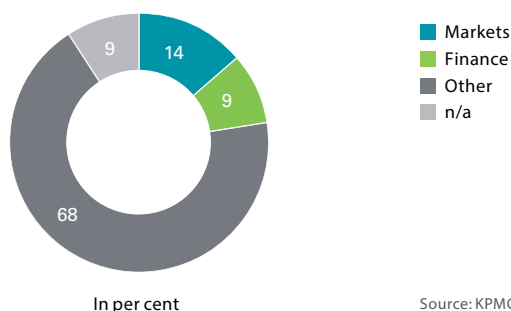


Fig. 9 Owner of the associated profit/loss from the liquidity cost benefit allocation



Roles and responsibilities

Liquidity management engine room

Most regulators now require banks to establish a liquidity measurement and control function independent from the markets unit and sometimes insist on it being within a bank's risk function. It is therefore not surprising that more than 80 per cent of the surveyed banks have placed their liquidity risk measurement and control responsibility directly in Risk or at least Finance. All the surveyed banks involve either Finance or Risk (Fig. 7). Responsibility for allocating liquidity costs/benefits is typically assigned to Finance and nowadays it is rare to see the responsibility left to a markets unit (Fig. 8). It is better practice for the liquidity cost/benefit allocation methods to be established in a function that is independent of P&L capture (see below). As the strategic liquidity management responsibilities are often also set up within Finance (at least at large banks), it is reasonable to also leave the responsibility for liquidity cost/benefit allocation within Finance and use that tool to manage and incentivize the business.

P&L ownership of liquidity risk

It is rare for the owner of the liquidity P&L to be responsible for also owning the liquidity cost/benefit allocation method. Circa 70 per cent of the surveyed banks allocate the liquidity P&L to central cost centres or specific business segments (Fig. 9).

Team size/expertise

LTP engine room staff

The teams responsible for measuring and controlling liquidity risk are significantly larger than the teams responsible for liquidity cost/benefit allocation (Fig. 10). There are at least two good reasons for this:

- As previously pointed out, following the global financial crisis liquidity cost/benefit allocation was less of a priority than liquidity risk control.
- Large banks tend to build their liquidity cost/benefit allocation mechanism on top of the measurement framework in order to closely interlink and leverage off management processes.

Banks with a balance sheet of more than EUR 500 billion tend to accommodate teams that are about double the size of their smaller peers.

Given that the liquidity risk measurement and control function is typically located in Risk, most of the teams have collected broad experience in Risk beforehand. For LTP, most of the team members have a business/trading background (Fig. 11).

Fig. 10 Size of team responsible for maintaining the models and enhancing them where necessary over time

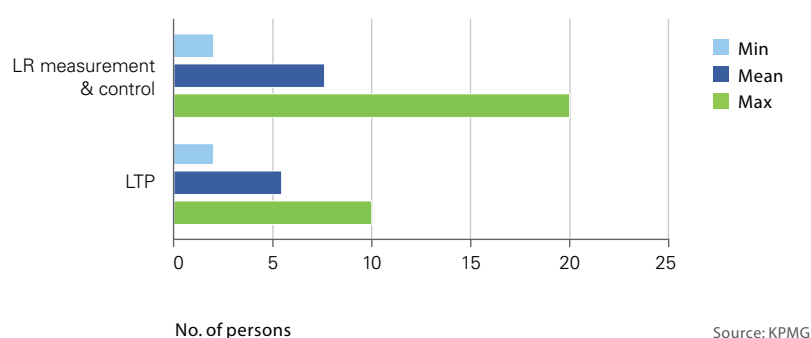
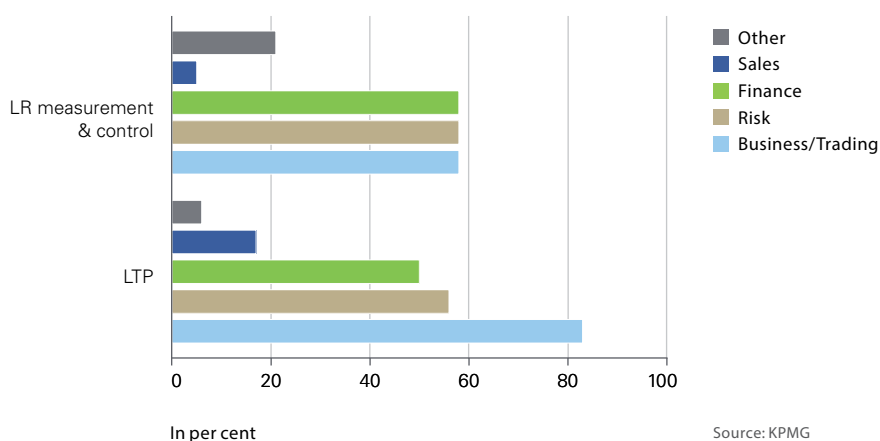


Fig. 11 Teams include members which have collected experience in the following areas (on average)



Key Findings

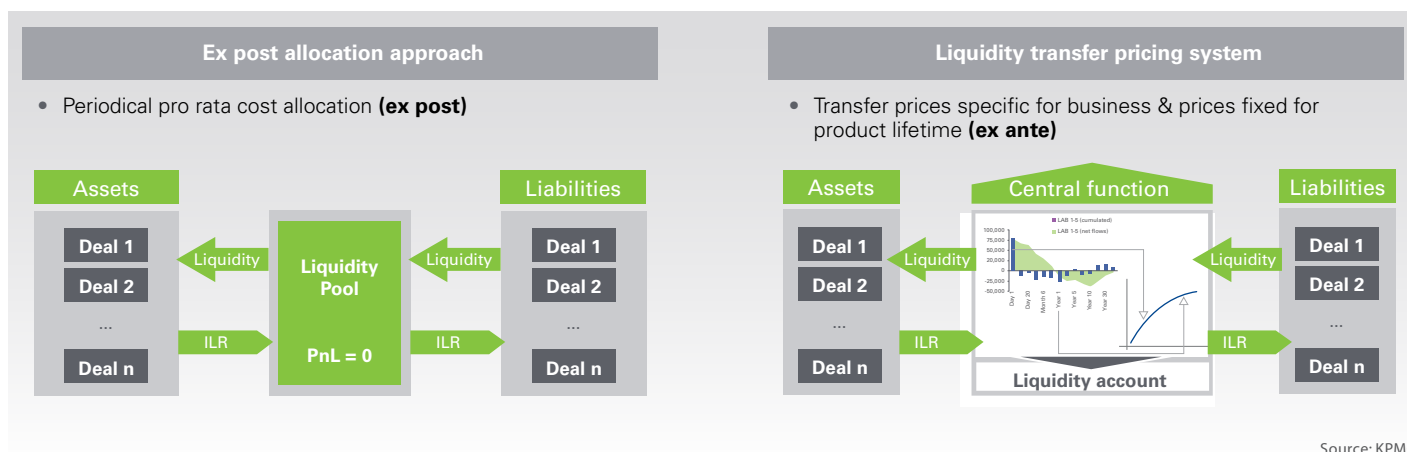
Fund Transfer Pricing

Fund transfer pricing (FTP) is one tool for internally managing the resource liquidity. Consequently it also serves as one of the key tools for managing the balance sheet. Ideally, it is linked to the risk management to enable risk-based pricing (or at least provide the transparency required).

Key observations

Better practice entails linking the liquidity risk measurement and controlling instruments with the LTP framework. While it is quite common to consider liquidity mismatch risk as part of LTP, banks are increasingly interested in embedding their liquidity spread risk into their LTP approach. Approximately one-third of the surveyed banks follow better practice and consider both base and stress scenarios in their approach to LTP. These banks typically run a transfer pricing system according to a base case.

Fig. 12 Approaches to liquidity cost/benefit allocation



Definitions

Base case

Describes a situation in which business-as-usual assumptions hold for the bank and the (financial) environment.

Stress case

Describes a situation where the bank and/or the (financial) environment is assumed to be under stress with regards to certain aspects.

Stress cases are used to ex post allocate liquidity reserve costs. Liquidity reserve costs are usually derived based on the refinancing costs of a reserve (typically funded longer than 3 months) and the yield of the liquidity reserve assets.

Basic liquidity cost/ benefit allocation

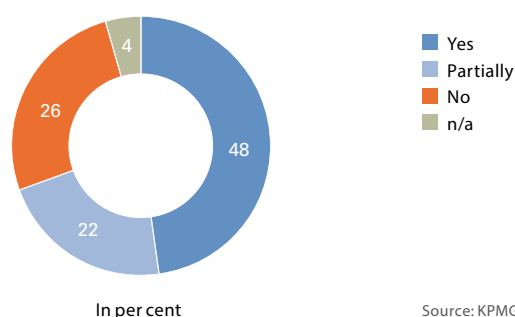
Liquidity cost/benefit allocation in transition

As previously pointed out, large banks are increasingly focusing on their models used to measure liquidity risk to form the basis for their liquidity cost/benefit allocation. However, the liquidity risk aspects covered by a liquidity cost/benefit allocation mechanism are diverse (Fig. 13). Banks generally link their liquidity cost/benefit allocation mechanism to their measurement methods, and since the financial crisis these have focused primarily on LMR. It is therefore not surprising that ca. 90 per cent of the surveyed banks also consider LMR in their liquidity cost/benefit allocation setup. However, some banks also explicitly consider liquidity spread risks (LSR) in their liquidity cost/benefit allocation and are in that respect front-runners in this context (Fig. 14).

Liquidity cost/benefit allocation – various scenarios

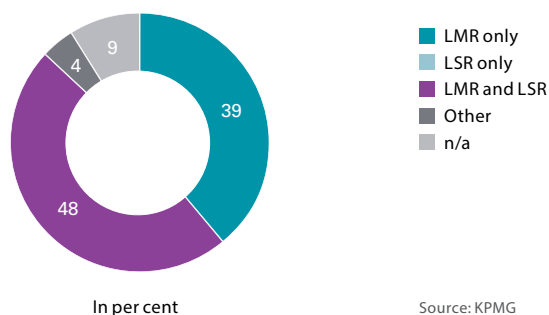
Only ca. 15 per cent of the surveyed banks base their liquidity cost allocation mechanism solely on a stress scenario. These banks do not use an expected view to allocate liquidity costs/benefits. Another 40 per cent base their liquidity cost/allocation solely on a base scenario. This practice poses a question around the allocation of indirect liquidity costs and, in particular, contingent liquidity costs. However, approximately 40 per cent of the institutions surveyed follow better practice and consider both base and stress scenarios for their liquidity cost/benefit allocation (Fig. 15).

Fig. 13 Banks where LR measurement and control models also act as a basis for liquidity cost/benefit allocation



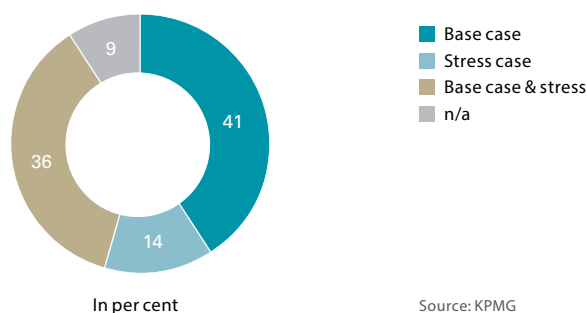
Source: KPMG

Fig. 14 Components included in the liquidity cost/benefit allocation framework



Source: KPMG

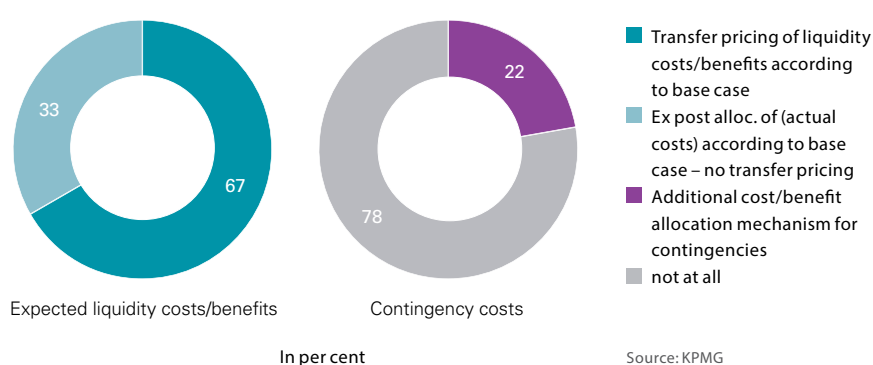
Fig. 15 Scenarios considered in the liquidity cost/benefit allocation framework



Source: KPMG

Key Findings

Fig. 16 Liquidity cost/benefit allocation for base case only

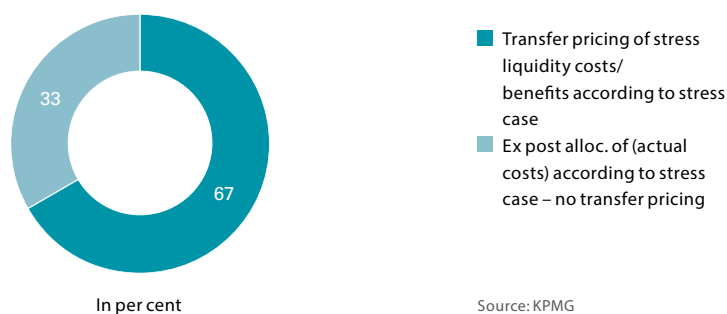


Liquidity costs/benefits – transfer pricing vs. ex post allocation

Business-as-usual liquidity cost/benefit allocation

Of the 40 per cent of banks that use a base case only, approximately two-thirds transfer the price of expected liquidity costs. Only 20 per cent of this 40 per cent subset (8 per cent) has implemented simplified solutions to allocate costs for contingencies. Simplified in this case refers to the fact that the banks are not allocating contingency costs based on stress testing output directly, but rather the implemented mechanism allocates calculated costs by other means (Fig. 16).

Fig. 17 Liquidity cost/benefit allocation for stress case only



Stressed liquidity cost/benefit allocation

Of the 15 per cent of banks that use a stress scenario only, two-thirds use a transfer pricing system to allocate liquidity costs/benefits. Such an approach is typically quite costly for business units (in particular) in stress sensitive areas, such as loan business with prolongation optionalities, deposits, etc (Fig. 17).

Combined liquidity cost/
benefit allocation

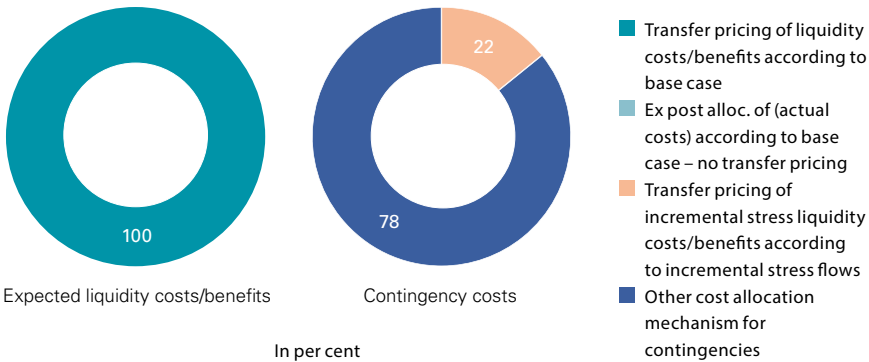
The 40 per cent of banks that use a base case and a stress case for liquidity cost/benefit allocation all run a transfer pricing system for expected liquidity costs/benefits. This system is based on a base case and stress tests to derive indirect liquidity costs (which are typically ex post allocated to business). Such an approach is less costly in a stable environment than the sole stress perspective outlined above (Fig. 18).

Operational insights for
contingency costs

One major driver for the liquidity reserve costs is the assumed refinancing tenor for the liquidity reserve. Usually, the refinancing tenor is directly linked to the liquidity risk tolerance (in times of stress) and the ability to withstand a range of stress scenarios with that liquidity reserve. The funding tenor is not long term, but approximately 70 per cent of banks fund their liquidity reserves over a period longer than 3 months (Fig. 19).

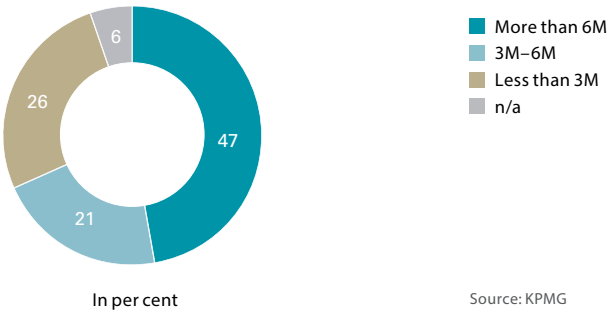
The largest surveyed institutions (balance sheet volume > EUR 1000 billion equivalent) fund their liquidity reserve portfolio to a larger extent over a term of more than 6 months.

Fig. 18 Liquidity cost/benefit allocation for base + stress case



Source: KPMG

Fig. 19 Assumed funding tenor for funding the liquidity reserve portfolio



Source: KPMG

Key Findings

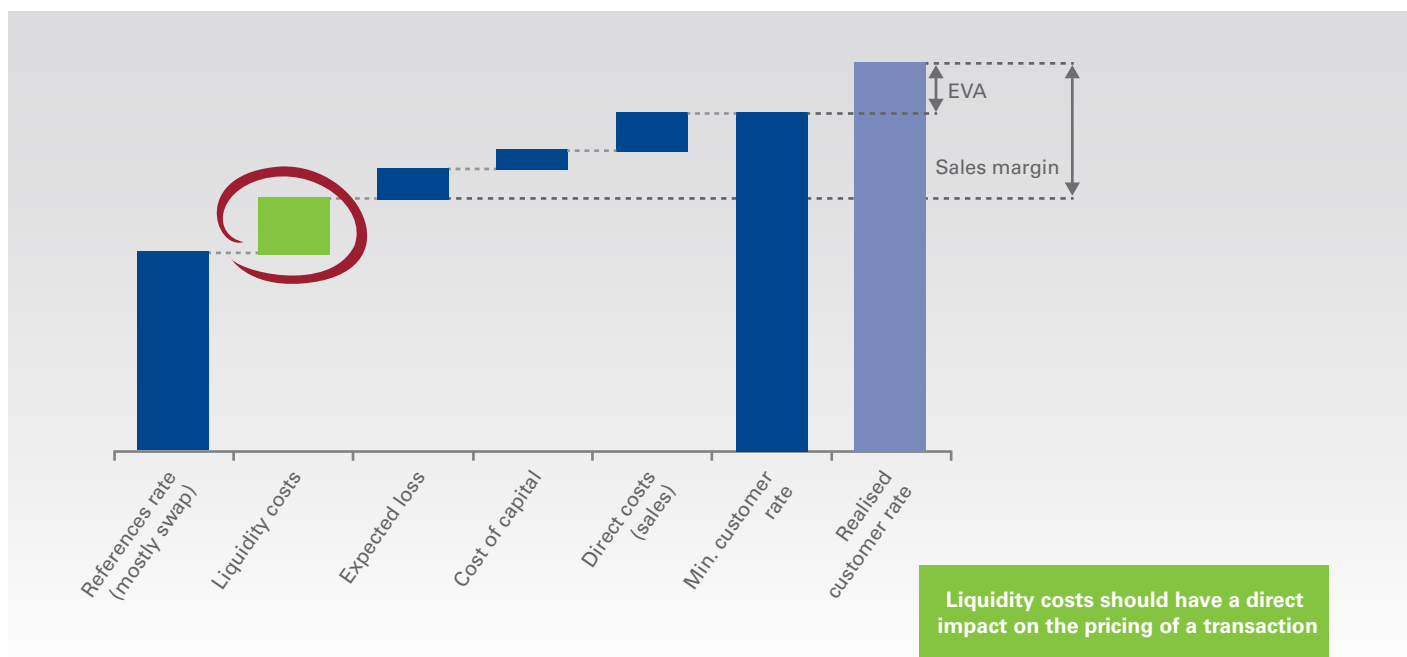
Customer Pricing

Liquidity costs should have a direct impact on the pricing of a transaction, i.e. is reflected in customer pricing, otherwise the wrong incentives may result (Fig. 20).

Background

It goes without saying that when determining customer prices, decision-makers should have as much information as possible about the different cost components. All such information is, of course, subject to time, resource and knowledge constraints. A lack of transparency of the various cost components, or neglecting to consider some of them, may lead to suboptimal decisions and losses in the long run.

Fig. 20 Liquidity costs as part of risk-based loan pricing



Source: KPMG

There are a number of practices for incorporating liquidity costs into customer pricing. Two of the main ones are:

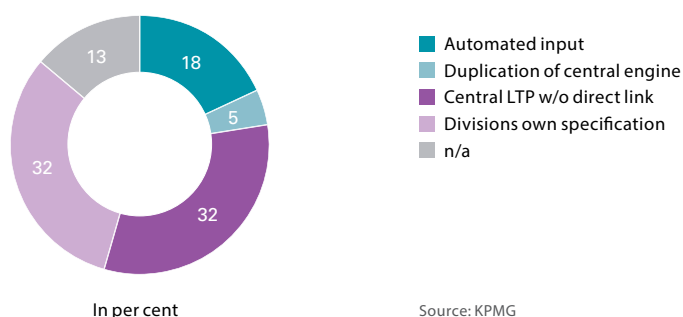
1. Automated feeding of centrally calculated liquidity costs/benefits into pricing engines and
2. Non-centrally calculated liquidity costs/benefits, derived either according to centrally defined standards or individually defined standards.

Liquidity costs/benefits and customer pricing

Aligning customer pricing and liquidity charges

Not surprisingly, most surveyed banks incorporate liquidity costs/benefits into their customer pricing. Only a few of the smallest institutions surveyed still do not follow this practice. Given the rising importance of liquidity costs for banks since the onset of the global financial crisis, setting adequate incentives for the business units has become crucial. Nevertheless, the method for integrating liquidity costs/benefits differs significantly between surveyed banks. More than 80 per cent of the surveyed banks do not automatically feed the (centrally) calculated liquidity costs/benefits into their pricing tools (Fig. 21). This disconnect is often due to technical constraints, as the implementation of automated feeds from the central calculation engine to the pricing tools of the divisions is highly complex, and costly to implement. In the smaller banks surveyed prices are automatically fed into pricing tools. While this may initially seem counterintuitive, it is explicable when the complexity of the different business models and their system environment are taken into consideration.

Fig. 21 Incorporation of liquidity costs/benefits into customer pricing



Source: KPMG

Key Findings

Deposit Modelling

The majority of deposit volumes (sight and saving deposits) are non-maturing accounts. With the onset of the financial crisis these liabilities have taken on a renewed importance for banks. To make better use of the structural value of these products requires liquidity modelling – for both the measurement of risk and LTP.

The survey sheds some light on the range of practice of the deposit modelling process for liquidity risk measurement purposes as well as LTP. This pertains not only to aspects of the modelling itself, but also to information on the main components which form the basis for deriving assumptions on future deposit behaviour.

Key observations

The importance of the deposit models is demonstrated by the fact that the assets-liability committee (ALCO or its equivalent) usually approves both the initial model as well as any changes.

For obvious reasons, the surveyed banks are working to increase the consistency between their liquidity risk measurement and LTP so as to create a single bank-wide assessment of liquidity. This trend is reflected in the growing application of common model frameworks as well as a common database.

Low-level data analysis requires a highly granular database and a very powerful framework. Cost and complexity considerations drive a preference for data analysis at the portfolio, rather than at the account or lower level. Parameters that are used for the construction of portfolios are derived using expert judgment as well as quantitative analysis.

Approximately 70 per cent of surveyed institutions form assumptions on deposit behaviour in a base case scenario and one or several stress scenarios for liquidity risk measurement purposes. By contrast, only about half of these institutions apply the same level of rigor for LTP purposes.

Caps for the maximum tenor of deposits are used by approximately 40 per cent of the banks surveyed. Caps on the original maturity as well as caps on the residual maturity were both found to be applied at the surveyed institutions, though caps on the residual maturity can be considered to be the more common approach.

The hedge portfolio for the run-off of deposits is typically static and based on a linear function, though more advanced approaches can also be identified.

Review and validation of model

Regular updates and validation of analyses to ensure the adequacy of inferences have also become more important. The survey indicates that a majority of banks (50 and 60 per cent for LTP and LR measurement and control, respectively) currently update their deposit modelling analyses at least on a quarterly basis. Some surveyed institutions have additionally introduced trigger values that require

irregular updates and validations to be performed (Fig. 22).

Consistency of data and model frameworks

Increase consistency, improve reliability

As previously mentioned, banks seek to improve consistency between liquidity risk measurement and LTP. This trend is evidenced by approximately 70 per cent of liquidity risk measurement and LTP models sharing the same model framework (Fig. 23). The survey results also show more than 70 per cent of the models are based on identical data sources. This may be driven by many causes. For instance, the following requirements are most likely to have compelled banks to increase the data consistency between the different areas (e.g. regulatory, risk, accounting):

- Internal reporting requirements (e.g. BCBS⁶ 239 – Principles for effective risk data aggregation and risk reporting; BCBS⁷ 133 – Principles for sound liquidity risk management and supervision);
- External reporting requirements (e.g. IFRS⁸ 7 – Disclosures).

As the largest institutions in most countries are required by regulators to also consider international publications that have not yet been enacted into national legislation, it is not surprising to find additional support for the assumptions above when analysing the breakdown of the results by size.

Fig. 22 Frequency of update/validation of analyses

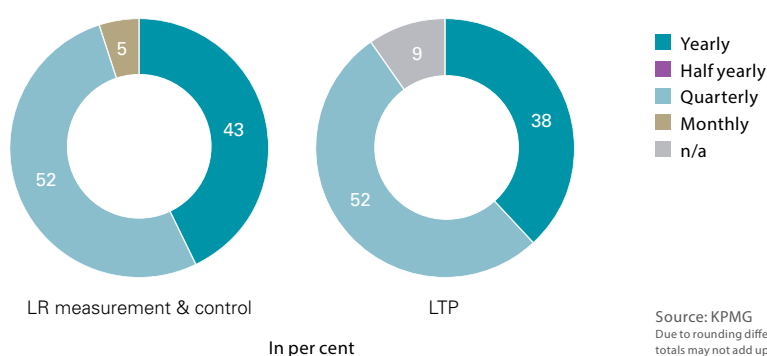
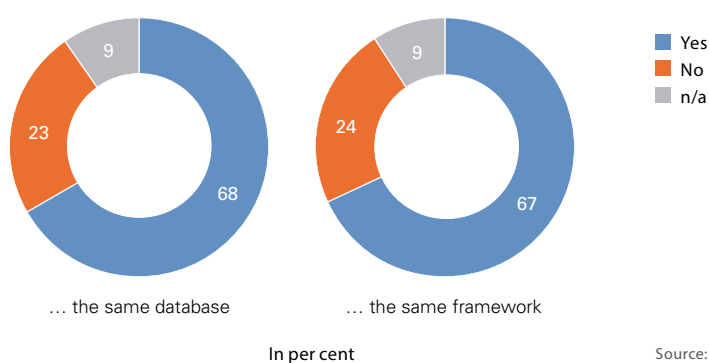


Fig. 23 Models for liquidity risk measurement and LTP share ...



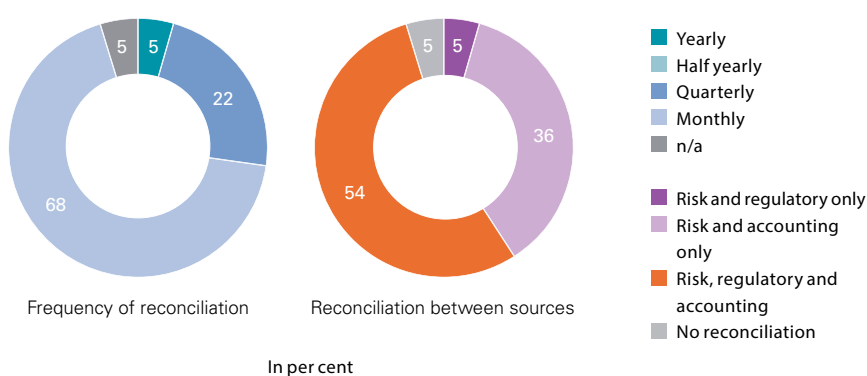
6 Basel Committee on Banking Supervision

7 ibid.

8 International Financial Reporting Standards

Key Findings

Fig. 24 Institutions' data reconciliations



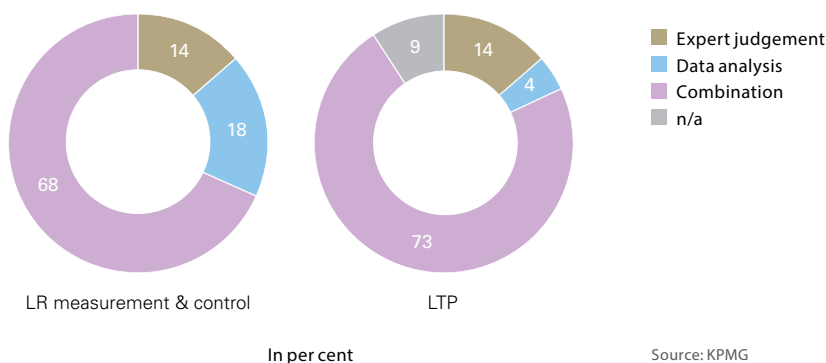
Source: KPMG

This is clearly demonstrated as the size of the surveyed bank increases:

- There is a greater likelihood of consistency between databases and frameworks used; and
- Reconciliations are more often run between risk, regulatory and accounting.

Evidence for consistency between differing data sources is usually collected by running regular reconciliation activities between data sources (Fig. 24). While most surveyed banks (ca. 95 per cent) compare risk and accounting figures, only ca. 50 per cent of the institutions also check the consistency between risk and accounting data with regards to regulatory data (Fig. 25).

Fig. 25 Input basis for deposit models



Source: KPMG

Input for modelling

Setup of deposit models

Deposit modelling at most large banks is based on both expert judgment and data analysis. This holds almost equally for LTP and liquidity risk measurement and control where ca. 65 per cent and ca. 80 per cent of all models are based on a combination of expert judgment and data analysis, respectively. The largest of the surveyed institutions never rely purely on data analysis as a basis for their LTP models.

Data analysis on the account (or even lower) level requires a highly granular database and a very powerful IT framework. Most surveyed banks (ca. 80 per cent) are intimidated by the costs and complexity of account-level modelling and therefore prefer to perform data analysis on the portfolio level. Again, this holds equally for LTP and liquidity

risk measurement and control approaches. Of the surveyed institutions, only those with a balance sheet size of less than EUR 1000 billion equivalent were found to analyse their deposits on an account level for their LTP framework (Fig. 26).

Availability of reliable historical data is often impaired by gaps in periods (e.g. due to mergers). Nevertheless, several banks have collected period data of more than 3 years (ca. 50 per cent for LTP purposes and ca. 55 per cent for liquidity risk measurement) and use them to ensure statistical significance. This holds particularly true as the size of the institution increases. On average, the larger the surveyed bank, the longer is the time period used for conducting data analysis (Fig. 27).

A high frequency of input data points is particularly important for a short-term view. Consequently, the frequency of liquidity risk measurement (ca. 95 per cent at least monthly) is higher than that for liquidity transfer pricing (ca. 80 per cent at least monthly) (Fig. 28).

Segmentation of portfolios

Breakdown of deposits

Highly parameterized portfolios have the advantage of creating more granular and hence more internally homogeneous portfolios. On the other hand, granularity implies a wider and less manageable array of correlation effects across portfolios. For liquidity risk measurement purposes, we observe segmentation based on between one and ten parameters.

Fig. 26 Granularity institutions are conducting their data analysis on

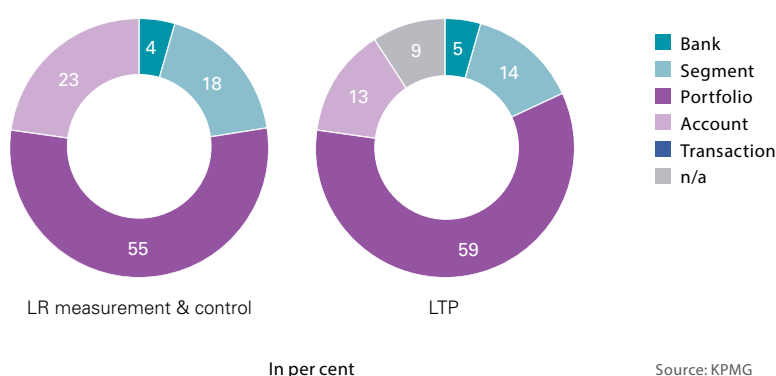


Fig. 27 Time period institutions are conducting their data analysis on

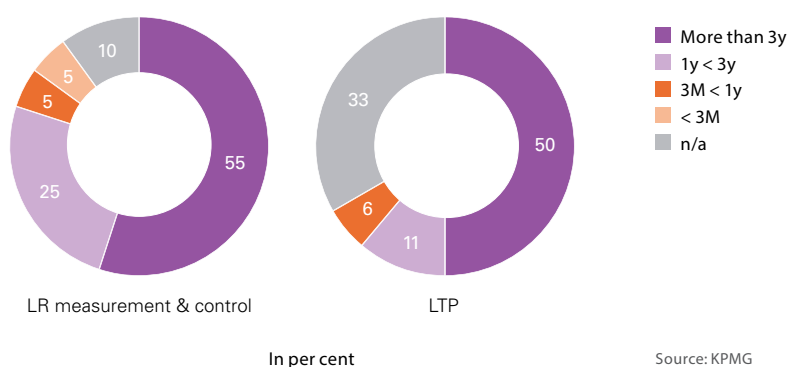
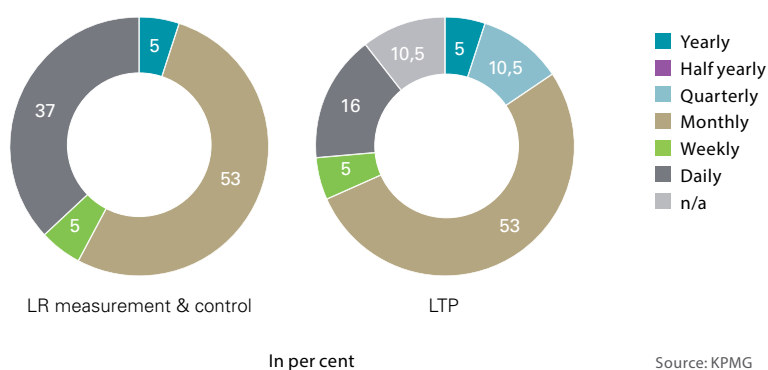
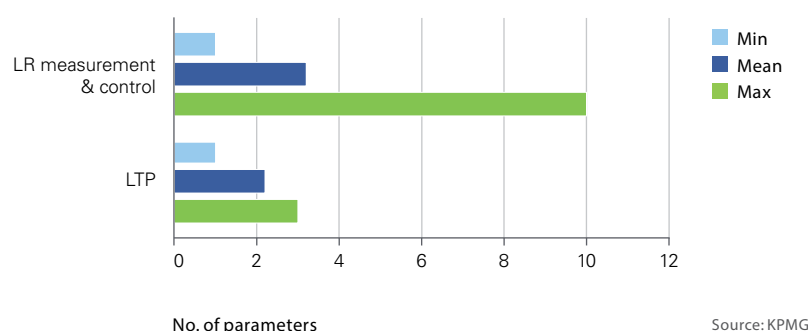


Fig. 28 Frequency of data points



Key Findings

Fig. 29 Number of parameters used in constructing portfolios



The maximum number of parameters for LTP purposes is three (Fig. 29). Curiously, the number of parameters used for constructing portfolios seems unrelated to organisational size.

Almost every surveyed bank distinguishes between product types when constructing portfolios. About 90 per cent do so for liquidity risk measurement and control, and roughly 70 per cent do so for LTP. The second most common parameter is the customer group, applied by ca. 70 per cent and 55 per cent (liquidity risk measurement and control and LTP, respectively).

One of the factors which is likely to be driving the use of the customer group as a parameter is the increasing necessity for including regulatory requirements as part of the economic management framework. Among others, parameters such as 'Currency', 'Volatility' and 'Interest Rate' are also in use at the surveyed banks (Fig. 30). Approximately 30 per cent of the surveyed banks derive their parameters simply by expert judgment for liquidity risk measurement purposes and 50 per cent for LTP purposes. Others use quantitative analyses (ca. 15 per cent for LTP and ca. 25 per cent for liquidity risk measurement), such as regression analysis, or combine both approaches (ca. 20 per cent for LTP and ca. 35 per cent for liquidity risk measurement) (Fig. 31).

Fig. 30 Common parameters used for constructing deposit portfolios

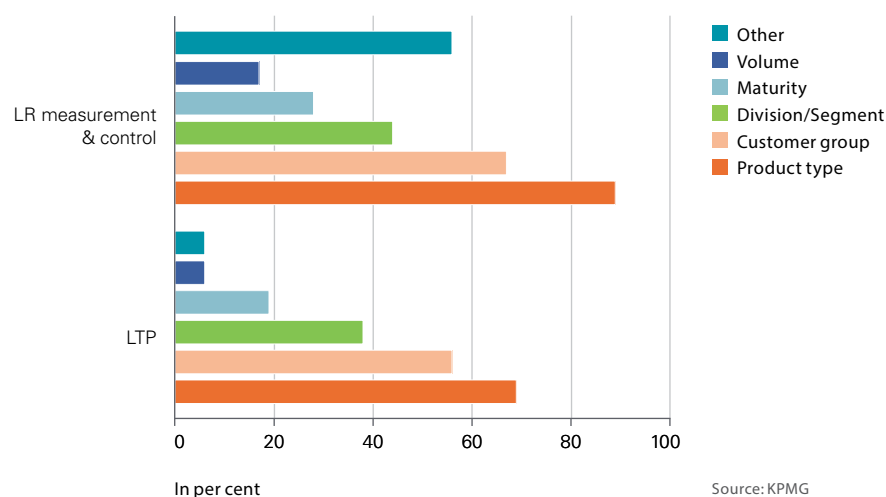
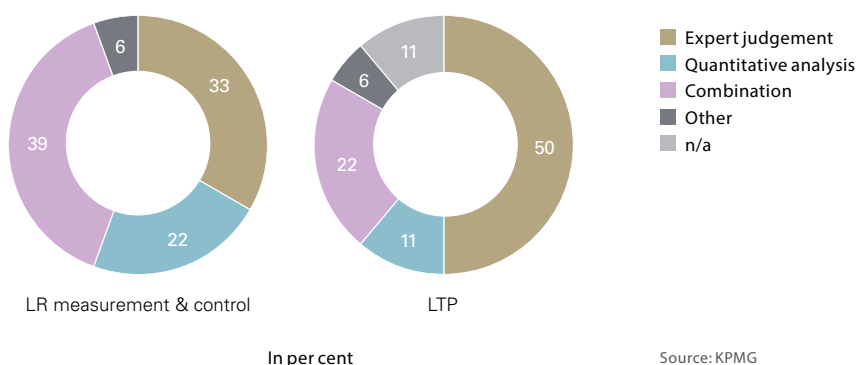


Fig. 31 How parameters are determined



Various scenarios for determining deposit behaviour

Business-as-usual vs. stress and deposit modelling

The sophistication of risk measurement deposit models, relative to those used in LTP, is also evident when analysing the assumptions around

deposit behaviour (Fig. 32). Around 70 per cent of institutions form assumptions on deposit behaviour in a base case scenario and one or several stress scenarios for liquidity risk measurement purposes. Of those institutions that perform LTP, only around 35 per cent apply the same level of rigor for their LTP. However, within the respective setups, the number of scenarios run for liquidity risk measurement purposes is similar to the number of LTP scenarios (Fig. 33).

Granularity of deposit models

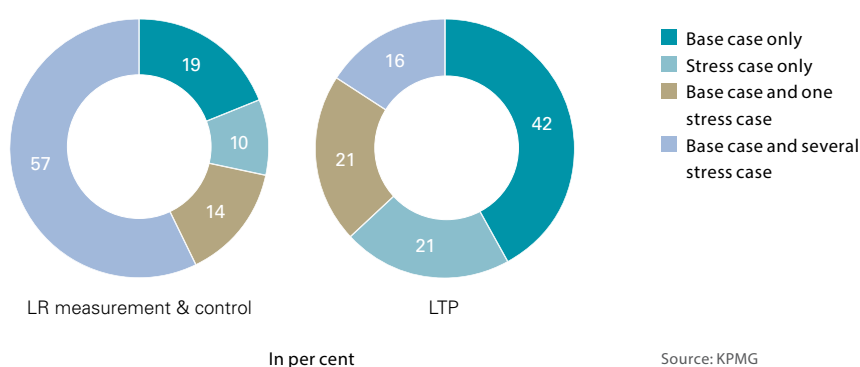
Approximately 85 per cent of the surveyed banks model deposits on a portfolio level for liquidity risk measurement and control purposes while 70 per cent do so for LTP purposes. Modelling on lower levels leads to a complex model framework and requires the consideration of the correlation between these low level aggregates. While this complexity is reduced when models are applied on a higher aggregation level, the intra-portfolio homogeneity tends to be lost in many cases (Fig. 34).

Hedging the deposit portfolios run-down profile

Hedging profile for deposit model

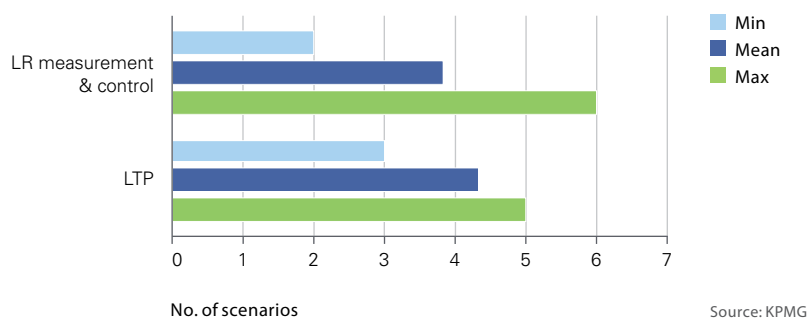
Most surveyed banks use a static hedge profile for their deposit model, both for measurement and control as well as for LTP. This means that the run-down profile for deposits is fixed (remains static) in terms of the deposit volume, decreasing over time. Only very few banks tend to adjust this static profile ("semi-dynamic hedge") and some other banks do use dynamic profiles, meaning they either adjust

Fig. 32 Scenarios used in determining deposit behaviour



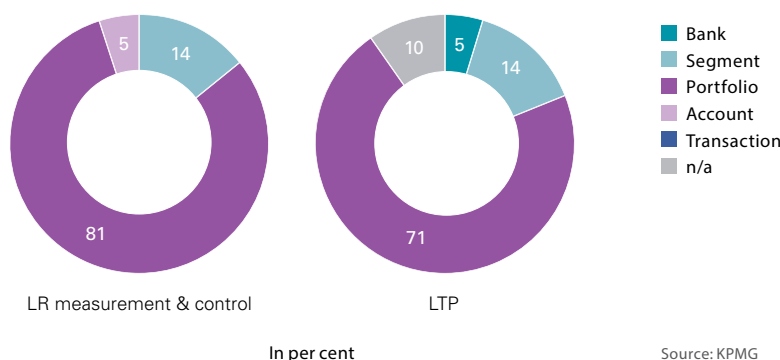
Source: KPMG

Fig. 33 Number of scenarios in the deposit behaviour framework in case there are several stress cases



Source: KPMG

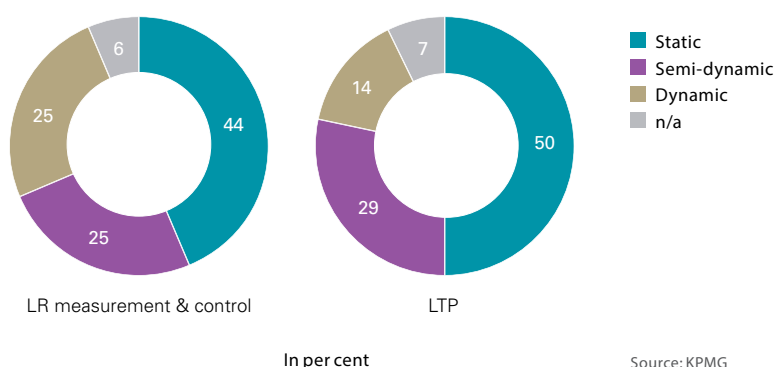
Fig. 34 Granularity level as basis for the institution's deposit model



Source: KPMG

Key Findings

Fig. 35 Institution's hedge strategy assumptions for deposit models



their profiles continuously or base their deposit profile on relative volumes to run-off, rather than fixed volumes (Fig. 35).

Forecasting

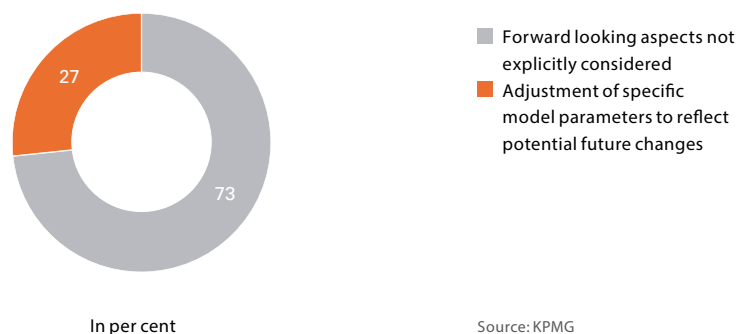
In contrast to other risk management approaches (e.g. for credit portfolio models), most banks surprisingly do not adjust their parameters for forward-looking aspects. This might be explained by the fact that most banks are still trying to get the basis modelling done accurately (Fig. 36).

Reacting to regulatory liquidity requirements

The regulatory requirements of LCR⁹ and NSFR¹⁰ have created considerable difficulties for banks over the past few years. Some institutions have spent heavily on the remediation of their IT infrastructures. Others have even re-evaluated product and business models in light of the new regulations. Some banks have already moved beyond 'simply calculating' the ratios and allowed business to manage them. Nearly 40 per cent of the surveyed banks have thus far incorporated LCR/NSFR requirements in the segmentation of their deposits.

The fact that 60 per cent of institutions have designed products to enhance their LCR compared to only few (~20 per cent) which have done so to improve the NSFR seems to be an expression of the underlying regulatory timeline. Most surveyed institutions are obligated to comply with LCR requirements starting from 2015 whereas the NSFR requirements are expected to come into effect a few years later.

Fig. 36 Incorporation of forward looking aspects in deposit models



⁹ Liquidity Coverage Ratio

¹⁰ Net Stable Funding Ratio

Outlook

The worldwide banking environment has changed significantly since the start of the financial crisis – in particular with regards to liquidity risk.

Regardless of a potential easing of the economic environment in the years to come, we do not expect liquidity risk to return to the insignificant status that was inherent prior to 2007.

New regulations and regulatory initiatives that have been endorsed, as well as those potentially still to come, support these expectations. We thus feel the need for banks to confront and deal with the challenges that arise when modelling deposits. Our survey revealed a broad range of deposit modelling methodologies and practices, which, in general, we still consider to be in its infancy with significant room for improvement.

In this respect we consider it most important for banks to align their risk view and funds transfer pricing view to avoid contradictory stimuli and to link the funds transfer pricing system to the overall bank management.

In doing so, banks will lay the foundation to reap the benefits of adequately managing deposits – most significantly, that of tapping into the long-term funding value of deposits while taking the desired level of risk.

Positioned at your best

With our multi-disciplinary team of financial industry experts and auditors, we are in a position to support you going forward with a wide range of expertise for the development of best practice solutions for asset liability management, funds transfer pricing and, of course, in all areas of the application of deposit modelling.

Should you care to discuss this survey in greater detail or have any questions concerning the results, we invite you to take advantage of our know-how and experience. We would also be interested in your opinion about our findings and how they might be applied at your institution.

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