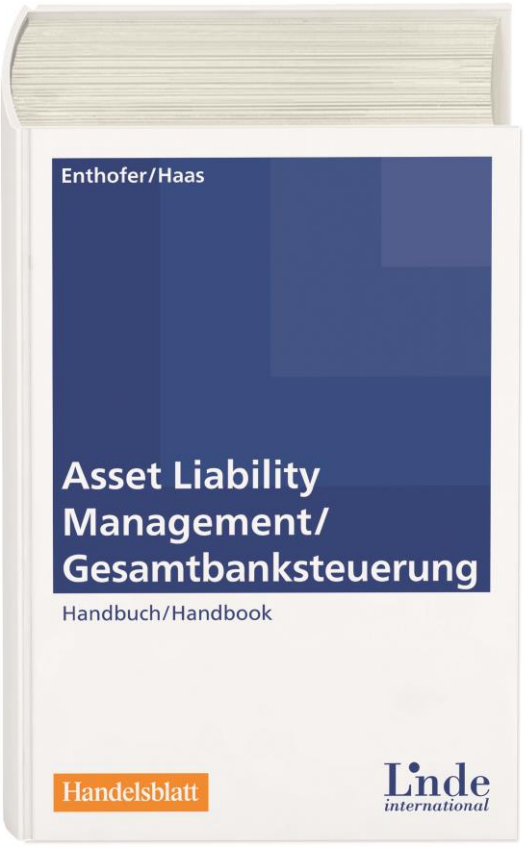


Organisation & Compliance

Asset Liability Management Handbook

Extract Chapter 1

For further information please contact

Finance Trainer International Ges.m.b.H.
Am Hundsturm 11
A-1050 Wien
Tel. +43 1 545 52 77
Fax +43 1 545 52 77 20
E-Mail: wien@financetrainer.com
www.financetrainer.com

Product details

Hardcover

Publisher: Linde Verlag (Jan. 2016)

Language: German/English bilingual

ISBN-10: 371430262X

ISBN-13: 978-3714302622

Product Dimensions: 17.7 x 7.1 x 24.9 cm

Content

1. Organisation & Compliance

1.1 ALM/TBM within a Bank's Business Model

A handbook on Asset Liability Management (ALM) and Total Bank Management

(TBM) is expected to fulfil the following challenges:

- To give an overview on organization, tasks, processes, interfaces and regulation
- To offer Know How on ALM/TBM Instruments and techniques of application

To do so we will describe the relevant parts of bank's **business model** first. The business model defines the room of action for ALM and TBM. Even with different business models (from Regional Banks to Private Banks up to Investment Banks and Online Banks) ALM/TBM should have a similar organisation, tasks and processes and are subject to the same regulation. The ALM/TBM will remain similar, even when markets, techniques and regulations are constantly changing.

Since the Financial Crisis in 2008 the business of banks is heavily discussed. Especially Regulators have taken serious steps to reduce systemic and economic risk coming from the banking sector. In doing so the Regulators are severely limiting the capability of bank management and bank owners to define their business models. Examples for these limitations are the increase of capital requirements, liquidity regulation, restrictions in trading activities, remuneration (cap on bonuses) or the rulings on restructuring and bank resolution.

Core of any bank activity is the bundling up of deposits and to grant loans out of these funds. Thereby a bank fulfils a **Transformation Task**: different amounts, terms of funds and loans are bridged. This is the core function of a modern bank; otherwise it is not a bank but a broker. In doing so banks can enable credit financed corporate and private investments as well as consumer expenditures through which an economy may grow.

Prior to the "Transformation Bank" bankers were frequently rich merchants who granted their own money in giving loans. You may think of the birth of banking in Medici's Florence or of the German Fugger family. This business model did not last. Bankers who offer their balance sheet for lending as core of their business model do not exist anymore. Alternatives to the "Transformation Bank" that came up recently are Crowdfunding or Peer to Peer lending. But they still have to prove their sustainability. In a "Transformation Bank" the funds for lending mostly do not come from their owners but from savings accounts and bond holders. Modern Banking has its roots in the Savings Banks and Cooperative Banks sector. These "grassroot

banks" collected excess money of a region to lend it to undertakings in need for money to invest. And they did so not only in their region but they also lend to similar institutions in other regions. This grassroot function in banking has its revival in today's microfinancing.

The most important skill of a bank is the assessment of potential debtors and the management of debtors in order to secure repayment of the principal and the payment of the agreed interest. We would call it core know how of a bank.

The Transformation Function creates Liabilities as well as Assets and, in between, interest income. Net Interest income traditionally is the anchor of bank revenues. Mismanagement in the loan business damages this revenue base and may put a bank's existence at stake.

Therefore credit rating of debtors is the heart of any bank's business model. Even if other services or capital market and asset management activities are sometimes strong pillars in a business model.

Starting with transformation of funds to loans and the subsequent revenue base, banks have included the following services in their business models:

Payment Services: Funds and Loans are attached to accounts where money is deposited, from where credits are paid out. Therefore transferring money from one account to another is closely related to the Transformation function. Payments will mostly always finish in one or another banking account. And it is of high importance to banks to know the transactions and accounts of their debtors in order to assess and manage well their ability to repay credits. Since Payment Services are more and more becoming a commodity (because of standardisation (like SEPA) or digitalisation (like block-chain technology) the revenue aspect is getting weaker. More and more important is the information you can get out of payment systems data – banks have to fight (or to pay) important non-bank service providers.

FOREX Transactions: Whenever a foreign currency is involved a bank is needed to handle the transaction. In this field banks are wholesalers, they collect many smaller transactions, and keep the risk resulting out of the many little positions under control before hedging them in the market. In order to add value to this wholesale function banks with important customer volumes and transactions will set up a proprietary trading and market making. Recent regulation has increased the capital and administration involved in trading – it will make it more difficult for small and medium sized banks to operate proprietary trading.

Buy and Sell Credits: Building on the loan assessment skills of a bank it may create value by buying from or selling FUNGIBLE credits to the market (syndicated loans, credit substitutes, Corporate Bonds, Asset Backed Securities). This business creates interest

income and valuation gains/losses. The intensity of activity in these markets shapes the business model. Simple Asset Backed Securities are going to be recognised by the Regulator whereas Bank Lending in any form the regulator puts at a disadvantage because of fears of the finance sector‘s systemic risk in case of a crises.

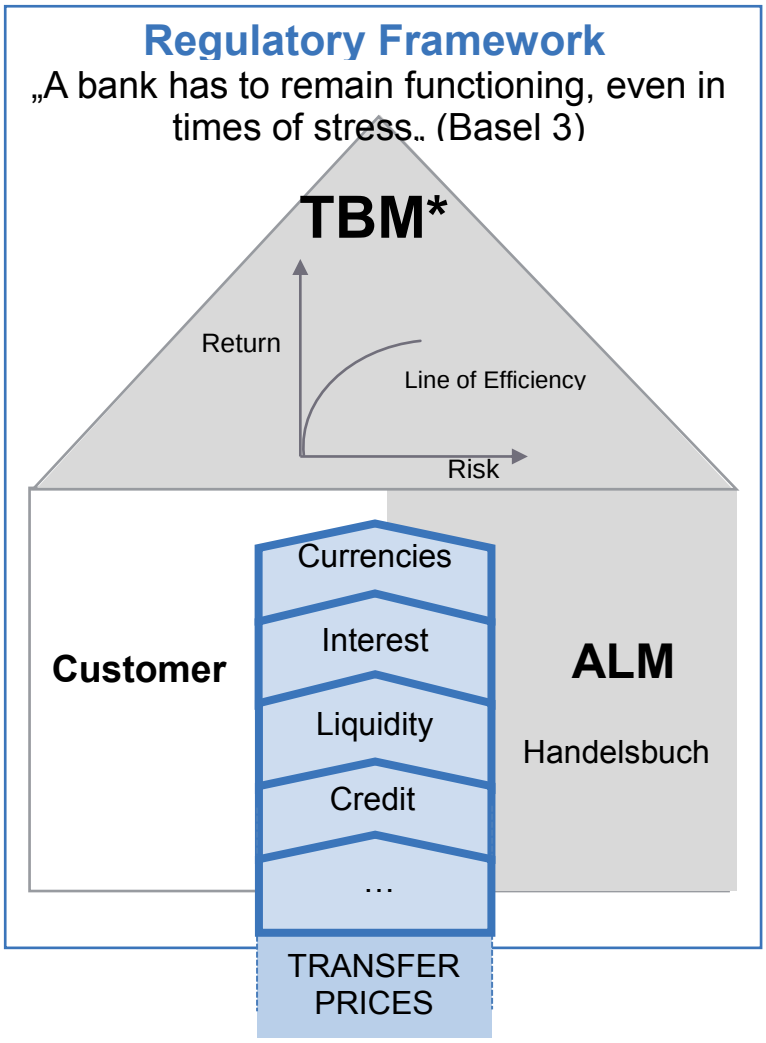
Forwards and Options: with Credits and different kinds of funding a bank is confronted with a high amount of interest- and market risks. These risks may be hedged with Forward and Option Transactions (Derivatives). These instruments are not only used for a bank’s ALM but also to corporates and investors for risk management or for structured assets. Since regulatory effort on risk monitoring, compliance and capital requirements has significantly increased this kind of products and services is in decline.

Investment Management Function: To structure risk, especially credit risk, in order to make it transparent and accessible for investors is an important part of banks business models, especially for international banks. From bond structuring and placement to the lead management for equity transactions to capital market advisory and the structuring of single credits into credit funds. Structuring know how, market access and placement power are the drivers for success in this function.

Which kind of a business model a bank is able to shape depends on its resources

(Know How, IT Systems, Risk Management Capacities, Client base). Alternatively resources have to build up or acquired to follow a defined business model. In any case the ability of assessing the future capacity of a client to be successful (credit assessment, rating, research) will remain the core of bank management, independently how much services a bank is offering.

All tasks and services of a bank will make part of ALM/TBM. Every single deal creates liquidity and risk. These risk positions have to be bundled, have to be made transparent, the risk has to be quantified and managed. In order to be able to reframe all the variety of products, transactions in order to manage the bank’s risks we developed the following concept of explaining the functioning of a bank:



Risk/ Return Management on Total Bank Level (RoE)

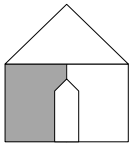
Risk free Profit Contribution

- Private Customers
- Corporate Customers

Earnings on Risk through the Trading and the Banking Book

* Total Bank Management

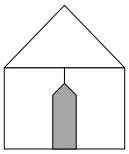
The goal of any enterprise and of any bank is to sell products and services that contribute to the company's profitability goal. Given a bank the return from (risk free) customer business should outweigh income created from risk (in the banking and trading book).



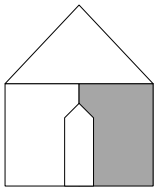
Base income from customers usually comes from interest income, the part of net interest income created by each single deal. In addition to interest income the

following services contribute to the customer result:

- Income from Transactions Services
- Interest and Valuation result from fungible credit business
- Margins from FX and currency business
- Margins from Derivative Sales
- Income from capital market transactions
- Advisory fees, especially in the fund business

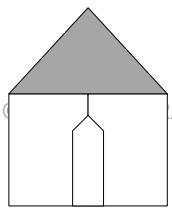


Transfer Prices are crucial in bank management. Transfer Prices express the cost/income from hedging a specific risk from a (customer) deal. They are "opportunity costs" which means that they express the alternative for customer risk in the financial markets, whether they are executed or not. They serve as "benchmark" at which risk is transferred to ALM/TBM. So they define the Risk Position resulting from each single risk inherent in a deal, they also serve as market price at which ALM/ TBM enters into this position. So ALM is as closely attached to Transfer Prices as are customer deals. ALM has the task to manage the risk resulting from customer and balance sheet business – Transfer Prices define the position and the price of the position. Risk on this position is measured by the Risk function of the bank, ALM limits risk within given limits and has the task to earn money on its position. Otherwise the capital attached to ALM risk will not pay off.

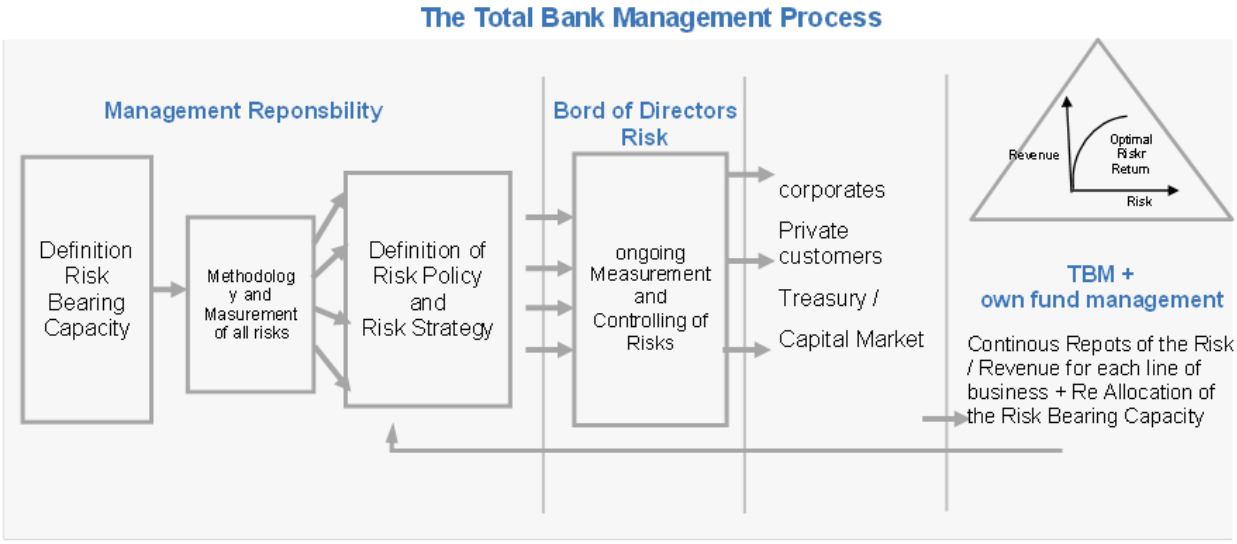


Income from ALM and TBM is composed of:

GAP Contribution: Income resulting from the interest difference on Assets and Liabilities at Transfer Prices. Total GAP contribution will be reported and managed separately for interest, liquidity cost- and credit spread risk. Income from the GAP Contribution will either be calculated on an accrual or mark to market (MTM) basis. An important task of ALM/TBM is to manage revenue and its volatility in different views: economically (which is MTM plus accrual YtD), and a mixed view of accrual and MTM as it is required in (IFRS) accounting. ALM and Trading have exclusive access to the Financial Markets within the organisation of a bank. The financial crisis has led to the conclusion that revenue from ALM and Trading should be substantially lower than income from customer business. So recent regulation is imposing more capital on risk allocation with financial markets as well as more reporting and compliance requirements.



The “roof” of our model bank is where Total Bank Management (TBM) takes place. TBM defines the Risk Return which is expected from the business model and the strategy of the bank. For Risk Return Harry Markowitz´ theory is still valid:[1] the higher the return expectations the higher the risk. If risk is close to zero, return will come down to the risk free rate. And as crises fighting measures demonstrate today, the risk free rate by itself may go close to zero. Risk Return is not a theoretical concept. It is defined by the business model and the attached risk appetite and return expectation. To be able to define a business model it requires requires resources like capital, know how, systems and customer potentials. Management will therefore build on existing resources and will build up future resources. A drastic example of mismatch in resources and a business model was Hypo Alpe Adria Bank, a bank expanding into south east Europe at high speed. But the capability to assess and to manage debtors could was not at the required levels. Total Bank Management is translating the Bank Strategy and Risk Policy into Capital allocation and RiskReturn expectations/plans for each business line. This is a process is supervised by the regulator in form of the ICAAP (Internal Capital Adequacy and Assessment Process) and the mid-term impact of business plans on profits and capital.



Regulatory Framework restricts the possibility of shareholders and bank management to define business models. Banking Regulation is directed towards the limitation of risk inherent in the finance sector. The Markowitz rule would say – the less risk a bank is able to accept the less transformation tasks it will be able to fulfil resulting in lower profit expectations. Or – the other way round: Less risk means less volatility in banks results and fewer financial crises. Today‘s Banking Regulation is very conservative: Banks have to demonstrate that they are able to survive – even in periods of stress conditions. In order to achieve this goal Banking Regulation limits the Transformation capability of banks (Liquidity Buffers through

[1] Cf. Harry M. Markowitz: Portfolio Selection, Journal of Finance, 7, 1952, ISSN 0022-1082, p. 77–91.

LCR; Less maturity transformation through NSFR; Guidelines to limit Interest Risk in the Banking Book, Limitations and more capital attribution for trading positions). Today's Banking Regulation not only requires the fulfilment of ratios but also bank internal organisation and processes. This so called Pillar 2 regulation is supervised by the regulators (SREP; Supervisory Review and Evaluation Process). In addition comprehensive compliance requirements with substantial penalties that are personally directed at the bank managers assure that the regulations will be respected. Therefor ALM and TBM are in eye of the comprehensive and ever increasing regulators Directives, Regulations, Guidelines and Technical Standards. All action to manage a bank's banking book have to be based on compliance with organisational standards and risk management benchmarks including limits and follow up whenever limits are violated. Therefore ALM and TBM have to anticipate regulatory actions in order to be able to adapt their organisation and their business model. To be in line and ready as soon as a new piece of Regulation is implemented it requires skilful and well informed people (also this is a compliance requirement) and a constant learning process.

1.2 The Tasks of the Asset liability Management /TBM

The main task of ALM is to limit and to manage market risks on and off the balance sheet. Management requires respecting internal and regulatory limits and control the revenue impact on the balance sheet.

Regulatory and internal limits are constraints. The goal of managing risk is to earn on it, to fulfil the revenue budget. Entering into risk without the intention to earn on it is neither an option for bank owners (who supply the risk bearing capital) nor for the regulators (who want to assure capital adequacy). In addition it is practically impossible to close all risk resulting from a bank's customer business and balance sheet.

The following risk will be managed by ALM:

- **Interest Risk:** means the reduction of interest income through unfavourable interest movements. Alternatively it means the reduction of the market value of the interest risk position. Both views are found in ALM: bonds usually follow the mark to market view, loans follow an accrual view. ALM management concepts, reporting and limits have to reflect this dual view.

- **Liquidity Risk:** risk of insufficient funds resulting in illiquidity. This risk is managed by keeping liquidity buffers that can be turned into liquidity in the case of stress.

- **Liquidity Cost Risk:** means the reduction of interest income (or mark to market value) through an increase in liquidity cost (= funding spread)

- **FX Risk:** losses from unfavourable movements in foreign currency. ALM cares especially for FX positions resulting from the balance sheet like equity holdings.

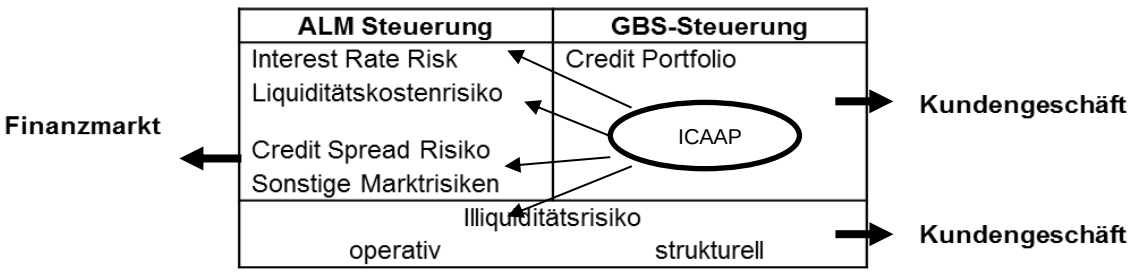
- **Credit Spread Risk:** Mark to Market losses from spread variations in the bond and derivatives portfolio.

- **Other market risks:** all significant risk that can be managed with Financial Markets Instruments is ALM Risk. Most frequent other risk are investments in equity/ shares.

Risk Measurement is conducted by a strictly separated organisational unit (Risk Controlling). Maximum Risk is limited for each risk category. These limits are derived from the risk bearing capacity of the bank. Subsequently the risk policy and strategy defines the risk/capital allocation to the single risk categories following

Risk Return considerations. Management of credit portfolio risk, which usually is the biggest risk in a bank's balance sheet is not normally part of ALM but Total Bank Management (TBM). To manage credit risk portfolios on ratings, countries, per industries and maturities as well as avoiding cluster risks and concentration risk and managing overall risk weighted assets is rarely something that can be done by derivatives or other financial market instruments. It has to be managed by intervening in the customer business:

Loan to Value (LTV)-Targets, NACH collateralisation, limitation in maturity, minimum ratings or buying/selling of credit portfolios requires the involvement of the respective business lines and decisions taken by the whole management board. So all the consequences on a bank's performance can be evaluated and a broad decision base can be achieved.



Market risks in ALM are limited within ICAAP by decisions of the Management and Supervisory Board (Risk Strategy) and are managed mostly independent from customer business. TBM means the Management of credit portfolio risk by measures influencing the bank's credit portfolio. ALM and TBM are involved in Liquidity Management: ALM is cares for

short term liquidity (including LCR) whereas TBM takes structural decisions on long term liquidity. Since ALM cares for market access for all liquidity and many liquidity topics involve short term an long term issues (e.g. encumbrance decisions) close cooperation of ALM and GBS are frequently required.

The following organisational patterns in ALM and TBM can be found:

ALM and TBM in one committee: there is an advantage to manage all risk in one committee, but there is a disadvantage that not all committee members will be involved all the time and that the agenda is exhaustive.

TBM is a separate committee of all board members, headed by the CEO: this organisation will include the ICAAP management. In addition to ICAAP reporting the allocation and re-allocation of capital will be decided by the TBM.

TBM is a separate committee of all board members, headed by the CFO or CRO: this set up will rather focus on risk limitation and the management of ICAAP risk factors.

For the organisational setup of ALM two concepts can be found in banks:

ALM is part of the Market Organisation (Financial Markets, Capital Markets, Treasury): The ALM committee, headed by the respective board member decides on risk positioning, the ALM department manages the positions within operative limits for the daily management on its own. If a Bank has a Trading Book ALM will hand the execution of deals to the trading unit. In banks without trading unit ALM executes the market deals by itself. In both cases ALM will have an earnings budget to fulfil.

ALM is part of the Non Market Organisation (Finance, Risk): In this case the ALM committee details its decisions more precisely, because ALM as a Non Market Department is not allowed to enter into risk positions by itself. All action that is not defined by the ALM committee (e.g. actions between ALM committee meetings) needs to be in a strict line with the risk policy and risk strategy of the bank. In addition the ALM department must not have market access; therefore the deals have to be handed over to some market unit for execution.

In order to distinguish between ALM's Banking Book and the trading book there is regulation to be respected:

- **Liquidity Management** has to be part of the banking book (CEB's Technical Advice on Liquidity Management 2008)
- A recent EBA Guideline on **Interest Risk Management** (Guidelines on Technical aspects of the management of interest risk arising from non-trading activities, May 22,

2015) rules that active risk positioning in the banking book creates a trading book like situation with risk measurement requirements in the ICAAP that equal the trading book's risk management requirement. We therefore advice to define the structural risk position in the banking book within risk policy and risk strategy.

- **FX Risk:** short term FX positions will be either managed in the trading book or hedged as good as possible. Strategic FX Positions (e.g. from equity holdings) make part of the banking book. The open currency position will be part of the banking book and is limited as a percentage of equity by the regulator.
- **Risk from shares or funds (including ETF).** If these Positions make part of Risk policy and Strategy of the bank they may be attributed to the banking book.

In banks rulebooks frequently minimum holding periods for banking book positions can be found (e.g. 6 months). There is no regulation regarding minimum holding periods. Since the trading book's purpose is to make short term profits these internal rulings might serve as a yardstick to distinguish between short term and longer term profit intentions. Longer holding periods might limit the banking book's ability of a bank to react on market events or make reactions more expensive and capital extensive (reversals, close outs). These examples show one aspect of creating a risk strategy for the banking book.

1.3 The Transfer Price as the Foundation of ALM

Transfer Prices are separating the result of a transaction into customer contribution and risk contribution. Transfer prices follow the opportunity cost principle: This principle asks what a hedging of risk (interest, liquidity cost, FX, Credit Spread, …) inherent in a transaction would cost at financial market prices. Independently, whether the hedging will really take place.

Thus Transfer Prices achieve the following goals:

- **Separating Customer from Risk business:** The application of Transfer Prices for each single transaction assumes that every deal will be hedged against risk. Thus one can calculate the customer margin without market risk. Customers are not responsible whether risk inherent in their transactions will be really hedged or not. Applying Transfer Prices the customer margin remains constant during the whole products life, independently from interest movements, higher liquidity cost or changing currency prices. The Transfer Price is at the same time the (market)price ALM (or TBM) is entering into a transaction. If ALM decides to hedge the risk position immediately it should be able to do so without any profit or loss. This is an approximation because of bid/offer prices and because a bank normally is able to hedge positions only after bundling many customer transactions due to the small size of customer business and big sizes in the financial markets. So the risk position and earnings/ losses out of customer business will never be zero. In addition ALM will enter into customer driven risk positions in order to earn on the risk capital employed.

- **Definition of the bank's risk positions:** A Transfer Price always refers to maturities, ratings and currencies. So risk positions, like interest or liquidity risk will be reported in maturity bands. New deal´s risk will be added to the existing positions. And it is not only the positions volume of every deal that is integrated in the bank's risk position. In addition the Transfer Price at conclusion will be fixed and attached to the risk position. So the basis for risk- and revenue reporting is founded on Transfer Prices.

- Based on the risk positions models the methodology for **risk measurement** will be applied and risk will be quantified. Wrong or bad Transfer Prices result in wrong risk measurement. Since many products and transactions have undefined interest or capital maturities (e.g. savings accounts, at sight accounts, …) the Transfer Prices for many products have to be modelled and validated in order to have a good foundation for managing and measuring risk and revenue.

- **Transfer Prices create responsibilities:** Single Deals margins based on Transfer Prices are attributed to Customers, Account Managers, Profit Centres and Business Lines and are the basis of profitability accounting. The very same Transfer Prices, paid and received, result in the ALM contribution. They may be reported on accrual or mark to market basis. And if methodology is correct and comprehensive the cumulating of the customer and ALM result can be synchronized with the Total bank result. Wrong or incorrect Transfer Prices show a distorted distribution of revenue between risk and customer business or between different customer lines. This may hamper a bank's competitiveness.

The methodology of utilizing Transfer Prices shows the following example on an accrual basis:

Question: How much does the example bank earn on a) customer business, b) interest risk, c) liquidity cost risk and d) credit risk?

A simple two products balance sheet is composed out of a 5 years bullet credit to a corporate with Rating a and a nominal of 100 at an interest rate of 7.25% at the asset side. The liabilities contain saving accounts at a nominal of 100 and an interest rate of 4.5%. Interest tenor is 3 month, maturity of savings accounts are modelled with a 2 years roll over maturity (that means half of the volume expires after one year and is reinvested for two years).

The bank has the following expenses

	Corporate Credit	Savings Accounts
Operating Costs	0.250%	0.140%
Overhead	0.100%	0.100%
Service fees	0.125%	
Loss Rate	0.300%	

Market conditions

Money Market (3 months interest rate)	5.00%
Capital Market (5 years interest rate)	6.00%
Credit spread for A Corporate:	0.44%

	1 Y	2 Y	3 Y	4Y	5Y
Liquidity Cost	0.05%	0.11%	0.18%	0.24%	0.30%

Profit and Loss calculation:

	P&L
Interest income	7.25
- Interest expenses	- 4.50
+ Service Fees	+0.125
- Operating Costs	-0.39
- Overhead costs	-0.20
- Credit Losses	-0.30
= Net profit	1.985

Now we split the Net profit in its components:

Calculating the "risk free" customer business:

Corporate Credit

Investkredit		Savings Deposit	
Interest Income	7.250	Interest Expenses	- 4.500
Transfer Price Interest	6.000	Transfer Price Interest	5.000
Service Fee	0.125	Service Fee	---
Liquidity Costs	- 0.300	Liquidity costs	0.080
Credit Spread	- 0.440		
Operating Costs	- 0.250	Operating Costs	- 0.140
Overhead	- 0.100	Overhead	- 0.100
=Profit Contribution	0.285	= Profit Contribution	0.340

0.625

- Assets: In calculation we look at each product separately, at the asset side at the corporate credit. The margin (Interest Rate minus Transfer Price Interest) amounts to 11.25 taking into account the 5 yrs (7.250–6.000). The banks calculates fee income (0.125), has costs amounting 0.250 for operating costs, 0.100 for overhead and 0.440. In addition calculated cost for liquidity (5 yrs) and for the credit risk inherent in customers rating amount to 0.300 and 0.440 respectively.

- Liabilities: We calculate the savings deposit: Interest margin is positive (0.50) with a customer rate of 4.50% and a Transfer Price of 5.00%. In addition we calculate revenues from liquidity cost attributed to the maturity of the savings accounts: 2 yrs Roll over means 50% expires after one year (with liquidity cost of 0.05%) and 50% after 2 years (liquidity costs of 0.11%), resulting in average liquidity costs of 0.08%. After operating and overhead cost we arrive at a profit contribution of 0.340.

Total income from customer business amount to 0.625 (0.285 + 0.340)

ALM business: Interest Income

	3 Months	5 Years	Total
Assets		100	100
Transfer Price		6.00%	6.00%
Liabilities	100		100
Transfer Price	5.00%		5.00%
			Profit 1.00

The table shows the interest risk positions of the two deals at the Transfer Price attached to Customer and Risk business. The GAP in Interest Risk between 3 month and 5 yrs results (with rates unchanged) in a profit of 1,000 (6%−5% on 100 notional).

ALM business: Liquidity Cost Risk

	3 Months	2 Years	5 Years	Total
Assets			100	100
Transfer Price			0.30 %	0.30 %
Liabilities	50	50		100
Transfer Price	0.05 %	0.11%		0.08%
				Profit: 0.22

The positions represent the view of ALM: Assets are charged with liquidity costs, liabilities earn liquidity premiums. Savings deposits are modelled (simple assumption 50% 1 yr, 50% 2 yrs). The profit contribution of Liquidity Cost Risk is 0.220.

ALM business: Credit Spread Risk Cost Contribution

Rating	AAA	AA	A	…	
Volume			100		
Credit Spread			0.44 %		
- Losses			0.30 %		
Profit Contribution			0.14 %		Sum 0.14

Credit Spread (capital market expression) would be expected loss in the customer business. If real life losses are lower than expected loss the contribution to total bank profit from credit risk is positive.

Summary, synchronizing the single deal and risk view with total bank profit:

Profit Contributions

Corporate Credits	0.285
+ Savings Deposits	0.340
+ Interest Risk	1.000
+ Liquidity Cost Risk	0.220
+ Credit Spread Risk	0.140
Total Bank Net profit	1.985

Equal results in the P&L statement and the synchronized results of customer and risk business, show a correct methodology.

Methodological precondition for efficient Transfer Prices

- Transfer Prices for all risk bearing On- and Off Balance Positions
  - Otherwise it is not possible to arrive at the total bank's result when summarizing all single customer and risk business. Bank Management cannot attach responsibilities to business lines and departments which allow them to manage the total bank‘s result.

	Vol	Interest	TP		Vol	Interest	TP
Loan	100	3,00%	1,00%	Deposits	90	0,50%	1,00%
				Own funds	10		

GuV Zinsergebnis	2,55
IGC Loan	2,00
IGC Deposits	0,45
Gap Contribution	0,10
	2,55

Ertrag auf zinslose Passiva

Not considering other assets/liabilities assumes that own funds are added to the gap contribution without interest. („Fringe Benefit“)

- Identical Transfer Prices for Customer Positions and Risk Transfer into ALM
  - Otherwise the difference (e.g. bid/ask spreads) has to be calculated and to be attributed to customer and risk business in a second round. Reduces transparency and increases complexity.
- Transfer Prices have to be market Prices
  - Otherwise hedging and managing risk on the basis of Transfer Prices will remain a theoretical concept.
- Transfer Prices are fixed when a deal is concluded and will not change during the deal's term

    - Otherwise revenue and risk will be miscalculated.
- Transfer Prices are fixed when a deal is concluded and will not change during the deal's term
    - Otherwise revenue and risk will be miscalculated.
- Products with undefined maturities have to modelled at its best and to be validated regularly
    - Otherwise the management of ALM risk will not be comprehensive and consistent and regulatory guidelines will be violated (compare EBA Guideline 05/ 2015).
- Transfer Price models positions without defined start date or end date (like equity, holdings, …) have to be modelled with a rollover technique. That means that the positions will be split over the maturities of their total term.
    - Mapping such positions to one maturity bucket is considered to be non-manageable and will result in significant jumps in return and risk.

In addition there are requirements for Transfer Prices of specific Risk positions:

- Maturity of interest positions must be equal to or shorter than the liquidity term of a product.
- Validation Goal of interest risk is the low volatility of margins. A Transfer Price should reflect customer behaviour the best way possible. Otherwise risk remains in the customer business and will not be sufficiently transferred to ALM through Transfer Prices.
- Validiation Goal of liquidity modelling is a suitable fit with empirical findings for the term of products WITHOUT new business. Modelling has to reflect the average term as well as the shape of the cash flows over time. If there is hypothesis about changing customer behaviour in the future this may be recognizes when documented and validated on a regular basis.
- Volatile Product Volumes have to be modelled by using ON position (for interest risk as well as for liquidity risk).
- Early termination of Transfer Prices (because of early termination of the underlying business) has to be quantified (on a mark to market basis) and the resulting profit or loss has to be attributed to the responsible profit center.

Since Transfer Price Methodology depends very much on consistency (all positions have TP attached; identical prices for customer and risk positions within each deal, ability to synchronize with total bank‘s result) we call it Transfer Price BUILDING. Management has to decide on Transfer Prices and changes. Validation is a continuing process under the responsibility of the CRO. Detailed Transfer Price considerations will be found in each of our 7 Worlds representing ALM and TBM Risk. Responsibility for Transfer Price Methodology lies mostly within the Risk Department, sometimes with Controlling but always in a non-market department. The daily update of market prices out of which Transfer Prices will be composed will be supplied by a market/treasury department, either trading or ALM.

1.4 Risk Measurement and Risk Adequate Capital

Generally, a bank takes banking risks to fulfil its financing function (see chapter 1.1). Managing the risk/return ratio and limiting the overall bank risk is done by the total bank management (TBM).

When it comes to banking risks, we differentiate between the risks of losses and structural and organizational risks.

In the banking business, the credit risk represents the classical risk of loss. Banks have to secure these risks of losses by building up capital buffers.

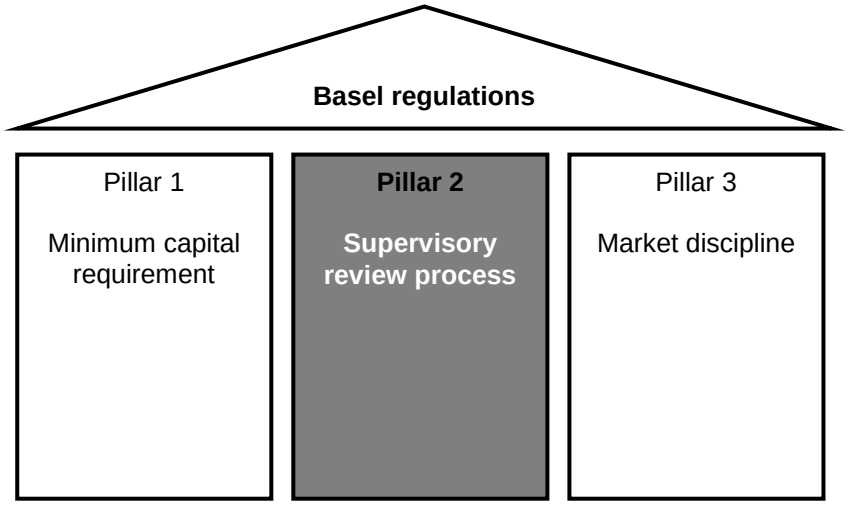
The risk of illiquidity, which arises when refinancing becomes a problem for the bank, represents the most important structural risk. For structural and organizational risks the following applies: safety buffers (e.g. highly liquid assets used in cases of illiquidity) and proven procedures need to prevent the collapse of a bank even in stressful situations.

Risk-adjusted capital – CRR pillar 1

Since taking risks can lead to losses, the legislature requires that a bank has to cover its banking risks (using equity capital) in relation to risks taken. The initially quite rough method which first focused on credit risks (Basel 1), has constantly been refined in the calculation of the necessary capital buffer: The capital adequacy method used for derivatives, the refined credit risk calculation with Basel 2, the liquidity cost risk methodology, stricter risk measurement for trading books, the credit value adjustments under Basel 3 and the development of standardized approaches with Basel 4 are examples.

These risk buffers required by law are to be held with tier 1 capital, percentage rates are always calculated by using a risk base (e.g. risk weighted assets (RWA) in the lending business). These rigorous (precise and equally calculated) capital requirements represent pillar 1 of the current banking legislation.

The minimum capital requirement can be found in pillar 1; dropping below the fixed minimum represents a violation of law and will be strictly penalized.



The 3 pillars of the banking legislation

Normally, banks make use of statistical risk measurement methods described in pillar 1, although individual risks of a bank (economic risk) cannot be described by using these approaches.

Risk-adjusted capital – pillar 2

In order to evaluate a bank's economic risk and thus be able to fix the target equity capital, banks need to calculate their risks economically and must install appropriate processes to ensure that required risk buffers are available in the future (ICAAP). The supervisory review process described in pillar 2 is therefor made use of.

In pillar 2 banking risks (in addition to pillar 1) are fully evaluated and it is ensured that capital adequacy (mostly equity capital for the risk of loss) is higher than the taken risks. The aims of risk utilization are reflected in a bank's risk policy and strategy.

The actual process in which we determine the risks of loss is referred to as the ICAAP (internal capital adequacy assessment process). All the risks of loss are measured, summed and compared with the capital adequacy.

CRD IV (article 107) defines all the risks which need to be part of the ICAAP and thus have to be included in a bank's risk catalogue. If one of those risks seems to be irrelevant for a bank, the bank needs to be able to argue conclusively why this is. Additional risks resulting from a bank's business model have to be taken into account, as well. In the ICAAP the following risks must be measured, limited and managed:

- Credit risk
- Remaining risk from credit risk mitigation techniques
- Market risks in both the banking and the trading book
- Securitisation risks
- Risk of liquidity costs
- Operational risks
- Risks arising from the macroeconomic environment
- Risks arising depending on the business model of a bank (margin risk)
- Stress test results

Additionally, the risk catalogue (minimum requirement) holds the following structural and organizational risks which thus have to be evaluated and limited:

- Risk of illiquidity
- Concentration risk
- Risks resulting from excessive debt (leverage)
- Money laundering and terrorist financing risks
- Systematic risks arising from the bank itself

Minimum requirements are set for the risk of illiquidity, the leverage-ratio and the concentration risk under pillar 1; the risk of illiquidity has its own supervisory review process (ILAAP = internal liquidity adequacy assessment process).

Approaches used for risk measurement (value-at-risk)

An approach in which all the individual risks are accumulated to only one risk value (in currency) is defined as a value-at-risk approach. The VAR is used for evaluating the credit risk, the interest rate risk, the currency risk, as well as some other risks, by making use of a specific methodology taking diversification effects into account. We thus use the VAR approach to accumulate all risks of loss to the overall bank risk. Generally, the value at risk approach is referred to as the evaluation of a negative change in value (measured in absolute terms) of an individual position or a portfolio, that will not be exceeded with a certain probability within a fixed time period.

The probability theory as a basis for the VAR

Modern risk management is mostly based on statistical methods. Thus it is essential to have some knowledge of relevant statistic basics. The most important statistical key figures are the mean or expected value and the variance.

- The **mean value** measures the average value of a number of values.
- The expected value can only be calculated if the probability of occurrence is known for each value. The average value evaluated based on the probabilities is referred to as the expected value.
- The variance measures to which degree values vary about the mean value.

Expected value

The expected value is calculated by multiplying all values of an event by their probabilities of occurrence and summing them.

$$EV = \sum_i p_i x_i$$

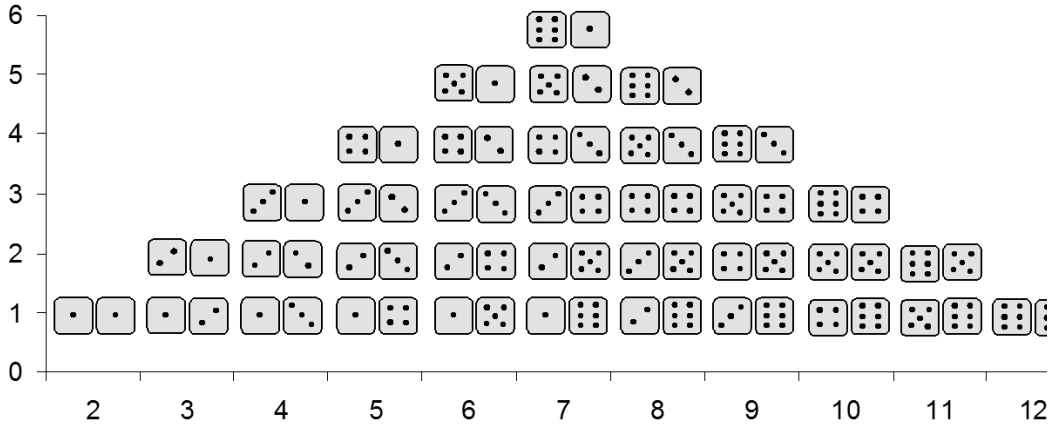
EV = expected value

p_i = probability of outcome i

xi = value of outcome i

I = index of outcomes

When playing with a die, there is a probability of one sixth (1/6) to throw each number. If you use two dice, different frequencies and thus different probabilities arise to roll a specific value.



The expected value is calculated by summing probability weighted values. When using two dice, the expected value accounts for 7.

Variance

The variance represents a measure of dispersion and is measured by the deviation of the actual value from the expected value (xi – EV). The variance is calculated by multiplying the squared deviations by their probabilities and then summing them. Squaring the deviations is done to avoid that negative deviations compensate positive ones (so dispersion would not be measured). Larger deviations thus receive a higher weighting than smaller ones.

$$Var = \sum_i p_i \times (x_i - EV)^2$$

Var = variance (σ^2)

EV = expected value

p_i = probability of outcome i

Note: Whenever the variance has to be estimated (on the basis of a sample), the formula for calculating the variance (and thus the derived standard deviation) slightly changes. The formula changes to:

$$Var = \sum_{i=1}^{n} \frac{\left(x_i - EV\right)^2}{n-1}$$

Var = variance (σ^2)

EV = expected value

n = total number of observations

x_i = value of observation i

i = index of observations

Even though the probability of one observation equals 1/n (where n is the total number of observations), the observations are multiplied by 1/(n−1).

Standard deviation/volatility

The standard deviation is calculated by taking the square root of the variance. In the financial world the term volatility is often used as a synonym for standard deviation. The standard deviation's dimension is, in contrast to the variance, the same as the dimension of the values (e.g. cm, kg or a monetary unit), whereas the variance represents a non-dimensional number. The standard deviation can thus be interpreted intuitively.

$$Stdev = \sqrt{Var} = \sqrt{\sum_i p_i \cdot \left(x_i - EV\right)^2}$$

Var = variance (σ^2)

Stdev = standard deviation (σ)

EV = expected value

p_i = probability of outcome xi

x_i = value of outcome i

i = index of outcomes

Confidence interval

As we have calculated the statistical loss/profit related to the expected value (standard deviation), we would like to evaluate the probability that a specific loss/profit will not be exceeded, as well. Thus a probability curve needs to be evaluated or estimated which is mostly done by using the normal distribution. According to the normal distribution, there is probability of 67% that losses/profits will not be higher than the standard deviation which means there is a chance of losses/profits exceeding the deviation of 33%. The confidence interval thus gives a range of values that you can be certain contains the arising loss/profit with a fixed probability.

We differentiate between **one-sided** and **two-sided** confidence intervals. 67% of the standard deviation is part of the two-sided confidence interval which means that both losses and profits will be within that range in 67 out of 100 cases. The confidence interval indicates the amount of profits and losses (summed) that might arise with a probability of 67%. The outcome might therefore be below or above the range with a probability of 33%.

However, from a risk point of view only losses are relevant. We thus need to evaluate the maximum possible loss given a certain probability. As a consequence, we mainly use one-sided confidence intervals for risk measurement. A one-sided interval provides the information below which value a random variable will fall given a fixed probability (or which value it will exceed, respectively). As the normal distribution is symmetrical, the confidence interval for the risk of loss is calculated by dividing the two-sided interval of 33% in half – which gives a one-sided confidence interval of 16.5%.

Based on the normal distribution, the standard deviation equals a one-sided confidence interval of 16.5%. The loss resulting from the risk position will thus not be exceeding the fixed value with a probability of 83.5%.

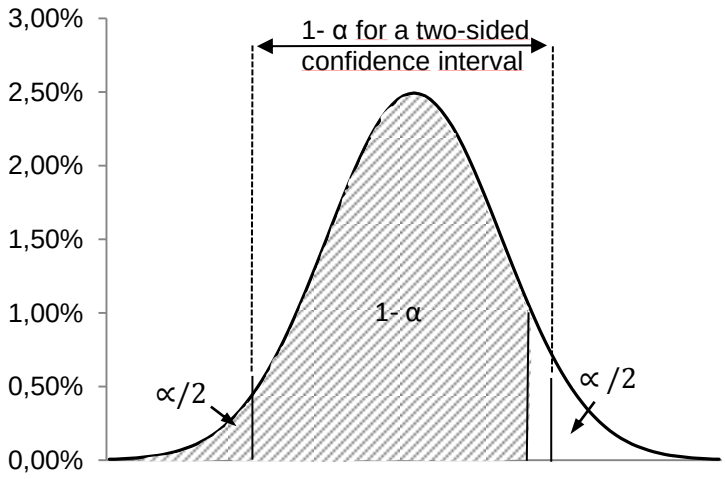
In practice, this would mean that losses will exceed the standard deviation on 16.5% of all trading days (which are 42 trading days of the total 252 per year). This is not an acceptable risk limit for the bank.

Confidence intervals of 99% and 99.9% are thus commonly used when measuring and limiting risks. This corresponds to 3 trading days per year or one day in 4 years on which losses will be exceeding the standard deviation.

As the normal distribution gives the dispersion, the confidence interval can be calculated as a multiple of the standard deviation.

One-sided		
Confidence interval	**Multiple of stdev σ**	**Interpretation**
90%	1.28	$P(z < EV - 1.28 * \sigma) = 10\%$
95%	1.65	$P(z < EV - 1.65 * \sigma) = 5\%$
99%	2.33	$P(z < EV - 2.33 * \sigma) = 1\%$
99.9%	3.09	$P(z < EV - 3.09 * \sigma) = 0.1\%$

where $P(z < EV - 2.33 * \sigma) = 1\%$ means that the probability that the value z is smaller than the $EV - 2.33 * \sigma$ equals 1%.



*α – level of error (one-sided confidence interval)

The graph shows both the two-sided and the one-sided confidence interval. The level of error splits to both sides for a two-sided confidence interval which is equal to taking into account profits and losses. The relevant area of values which will probably not be exceeded for a one-sided confidence level is highlighted in grey. The area represents a consideration of loss.

Holding period

In order to assess the risk of trading positions, it is essential to know (or to assume) how quickly existing risk positions can be closed by the bank (ALM/TBM).

In general, the risk of a position which can be closed from one day to the next is smaller than the risk of a position that has to be held 10 more trading days before it can be closed (caused by a lack of market liquidity, a position‘s size or the bank’s inability to react). This is because possible price changes become larger over longer holding periods.

As the standard deviation (volatility) is usually calculated based on daily price changes, the daily change in price has to be scaled up for longer holding periods. Adapting the risk figure for a longer holding period is relatively straight forward when using the normal distribution.

Formula:

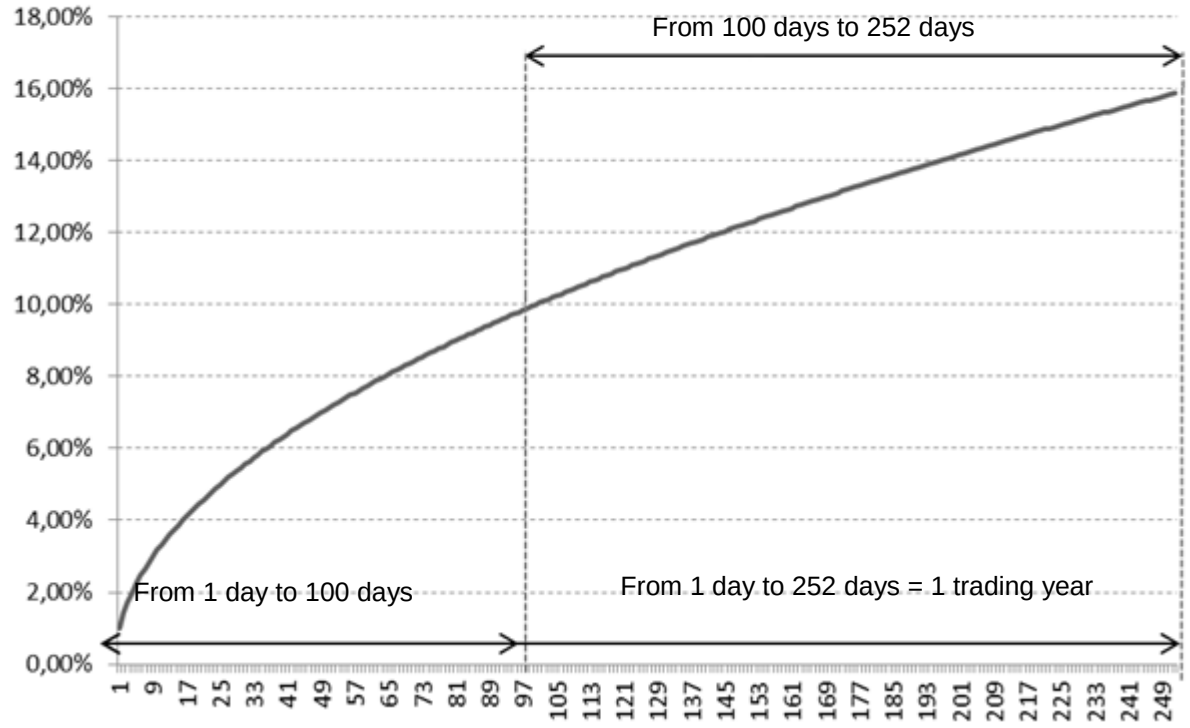
$$\sigma_n = \sigma_1 \cdot \sqrt{n}$$

σ = standard deviation

n = holding period in trading days

Note: The holding period is stated in trading days. The holding period accounts for 10 trading days if a position can only be closed after two weeks. A year counts as 252 trading days.

Adapting the volatility by trading days



The graph shows how volatility of 1% is adapted for 100 trading days and for a whole trading year (252 trading days). The x-axis shows the trading days, while the scaled volatility can be read from the y-axis. Starting at the volatility adapted for 100 days, upscaling to 252 days must give the same result as upscaling the initial volatility.

Correlation/covariance

The correlation and the covariance quantify the relation between two random variables, i.e. they describe how one random variable changes depending on the change of another random variable.

The parameters thus show how the 5-year EUR rate changes if there is a change in the 5-year USD rate.

The correlation can be interpreted as a normed covariance and its values may range from −1 to +1 by definition.[2] A correlation of +1 or −1 is defined as a perfect (positive or negative)

[2] The correlation between two random variables A and B corresponds to the covariance between A and B divided by the standard deviations of A and B.

correlation which represents a linear relation between two variables. A correlation of 0 shows that there is no statistic interdependence between two normally-distributed random variables.

Value-at-risk (VAR)

Measuring financial risks using the VAR can either be done by analytical solution or by simulation. The term analytical means that results can be calculated by using mathematic formulas. In practice the following VAR approaches are made use of:

- Variance-covariance method (analytical)
- Historical simulation
- Monte Carlo simulation

Variance-covariance method: The variance-covariance method which is based on the assumption of normally distributed random variables is used for analytically calculating the VAR of an individual position or a portfolio.

The volatility can easily be upscaled to a different holding period and a different confidence interval. It became standard to use a confidence interval (one-sided) of 99% and a holding period of 10 days for market risk measurement.

Example

What is the VAR of the following bond?

3-year bond

Coupon: 5%

PVBP[3]: 13.6983

Interest rate volatility: 7.6 bp (calculated based on daily fluctuations)

Step 1: Adjusting the interest rate volatility to a confidence interval of 99%

Interest rate volatility * conversion factor 99% = 7.6 * 2.33 (*) = 17.71

(*) conversion factor used for a confidence level of 99%

Interpretation: The daily interest rate fluctuations are expected to be less than 17.71 bp in 99% of cases.

[3] Change in the mark to market result arising from a 0,01% change in the interest rate.


Asset Liability
Management/
Gesamtbanksteuerung

Step 2: Adjusting the interest rate volatility (99%) for a 10-day holding period

Interest rate volatility99% * $\sqrt{time}$ = 17.71 * $\sqrt{10}$ = 56.00

Interpretation: The interest rate volatility expected for the next 10 days will be less than 56 bp with a probability of 99%.

Step 3: Calculating the risk based on the maximum expected fluctuation taking price sensitivity into account (PVBP)

VAR = interest rate volatility99%, 10 days * PVBP = 56 * 13,698 = 767,088

Interpretation: The VAR of the 3-year bond amounts to 767,088 which means that with a probability of 99% there will be no loss exceeding 767,088 within 10 trading days.

Note: In this example, the random variable assumed following the normal distribution is not the price of the instrument but the interest rate which in this case represents the risk driver. The instrument price can be related to (changes in) the interest rate. Possible changes of interest rates are estimated by measuring its volatility and adjusting it for the holding period and confidence level used.

Estimating a portfolio's risk using the variance-covariance method is done as follows:

- Calculating historical volatilities either for the individual positions of the portfolio or for a set of risk drivers (e.g. stock indices, interest rates, FX prices, etc.)
- Determining the holding period of risk positions
- Determining the confidence interval
- Taking the effects of correlations between positions or risk drivers into account

The great advantages of the variance-covariance method are its simplicity, the minimal computing time and the "traceability" of results using the parameters from the VAR calculation.

The necessity to make a number of assumptions which do not always reflect the reality however represents a significant disadvantage of the model. Assuming normally distributed risk factors is commonly criticized. In particular, the risk of asymmetric instruments like options can only be measured to a limited extent. Furthermore it is not taken into account that extreme fluctuations are more likely to occur than assumed in the normal distribution (so-called "fat tails").

A possibility to take advantage of the simplicity and traceability of the variance-covariance method is using the model to get an overview of the risks. In practice, this could mean managing risks daily using the variance-covariance method and applying more sophisticated and extensive measurement methods for defined time intervals.

Excursus: Modern portfolio theory – Harry Markowitz

The variance-covariance model goes back to Harry Markowitz. He argues that an investment can be described completely by its variance (risk) and its expected return which is the basic assumption of his portfolio theory developed in 1952.[4] The approach in which a portfolio is optimized based on the two key figures stated above is referred to as a “mean-variance” approach. The main idea of Markowitz’s theory is that investors are only interested in assets which would improve the risk/return ratio of a portfolio.

Historical simulation

If one cannot or does not want to make assumptions about risk factors, the historical simulation, a so-called model-independent method, may be used. It can be made without making assumptions about the type of distribution, the volatility and the correlations which means that risk factors are not studied analytically. In order to make the simulation, time series of market prices of all the underlying positions of a portfolio need to be available. When using the historical simulation, we study how values of portfolios currently held have changed during the chosen time interval. If we know the closing prices of the last 500 days, the portfolio’s result is determined for each day.

Fixing the confidence interval determines which days are not taken into account when calculating the risk. If, as in our example, the confidence interval is fixed at 99%, the five days (500 * 0.01) generating the worst result become irrelevant for risk measurement. The average loss of both the fifth- and sixth-worst day is set as the risk. Thus all historic correlation effects are taken into account automatically.

The challenging part of the calculation is selecting the optimal time slot. Using a very long time window raises the question to which extent past observations are still relevant for the current market situation. When choosing a shorter time window, it cannot be guaranteed that values observed are representative for the underlying risk (e.g. if a time slot only covers a period of economic boom). Furthermore, the risk of an estimation error increases with a smaller range of samples.

[4] A normal distribution is assumed again.

The main advantage is the model's independence. There is no need for assumptions, as parameters are taken into account based on historical prices. In contrast to the variance-covariance method, potential option risks (volatility, gamma) are taken into account automatically when applying the historical simulation.[5]

However, the historical simulation has a number of significant disadvantages, as well.

- Data: Collecting and analyzing historical data can be quite time-consuming, especially if a portfolio is managed actively. Whenever a new position is added to the portfolio, it becomes necessary to expand the database and thus the complete simulation has to be calculated all over again.
  As the portfolio composition changes each time a position is added, the simulation has to be done all over again which may cause that the overall risk rises even if a position is added to reduce the risk, as we have used a totally new simulation this time.
- Orientation towards the past: The historical simulation is solely based on historical observations, which means that we assume that there is no future without the past or i.e. we can only predict changes that have actually happened in the past.
- New products / illiquid products: Historical simulations cannot be made for recently issued products or illiquid products, as there are no suitable time series available.

Monte Carlo simulation

The Monte Carlo simulation is based on random numbers. In contrast to the historical simulation, possible changes of risk factors in the future are not determined on the basis of historical value changes but of random numbers.

Volatilities, correlations and the type of distribution have to be given for calculating the risk using the Monte Carlo simulation. A random number generator is used to evaluate a portfolio's future development for a certain number of situations. Having run all the simulations, the maximum loss is determined by choosing the confidence interval desired (in line with the historical simulation).

The most significant advantage of the Monte Carlo simulation lies in its flexibility which allows risk measurement of complex instruments and processes if there are no analytical formulas available.

[5] This statement, however, is only true of we assume a short holding period; effects that arise when shortening the term of a derivative are not taken into account by the historical simulation.

The required computing time is the main disadvantage which makes it necessary to find a compromise between speed (depending on the complexity of assumptions made and the number of simulations) and accuracy.

The effort of doing the Monte Carlo simulation is justified if risk structures are complex which e.g. is the case if a portfolio holds a significant number of derivatives. For simple risk structures, especially for those where there is a linear relationship between changes of risk drivers and value changes, the variance-covariance method is sufficient.

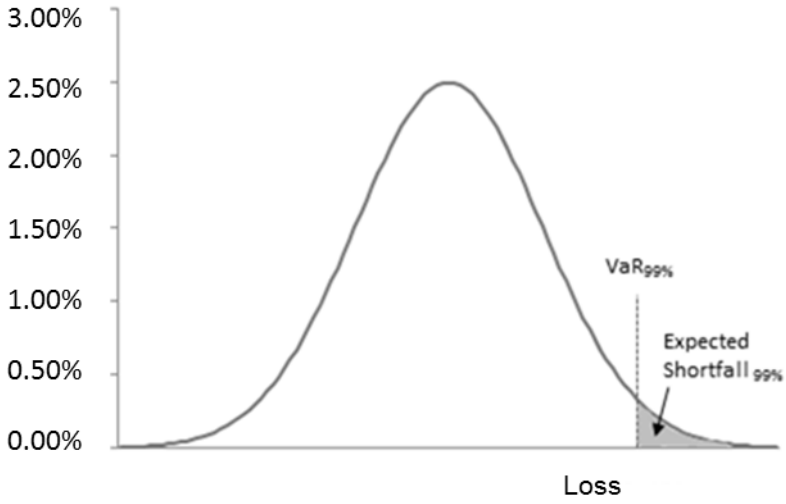
Generally, the legislature requires that observation periods used in VAR models need to be at least 3 years. This is just a minimum requirement regulated by law; the bank-internal requirement however should be that observation periods need to be long enough to guarantee validity of VAR approaches.

Stress testing

None of the risk measurement methods quoted above work without limitations and assumptions. Thus it is essential to understand the consequences if one or more assumptions do not apply. Methods simulating the effect of extreme market conditions and changes in assumptions are referred to as stress testing methods.

Stress testing is done using one of the following methods:

- **Scenario techniques** which evaluate the risk of possible results. Such techniques are used in the ECB bank stress tests.
- **Stress value-at-risk (SVAR):** Volatilities and correlations used for calculating the VAR are taken from periods with a high volatility. The SVAR represent the basis of the statement of changes in equity of trading positions under pillar 1 of Basel 2.5.
- **Expected shortfall** (or conditional VAR or expected tail loss): The expected value needs to be calculated for constellations in which the risk exceeds the VAR (or SVAR). The expected shortfall is used for measuring and revealing possible extreme losses. It always exceeds (or equals) the respective VAR. The ends (or tail risks) of the distribution curve must thus be known. Both internal risk models and newly proposed standard models used for measuring the market risk must be calculated by using the expected shortfall to evaluate the capital adequacy for trading book risks with Basel 4.



Characteristics of the main risks of loss

Usually, the VAR approach is used for calculating the risks of loss in order to evaluate the total bank risk in the ICAAP. If you are not able to collect the data needed in order to calculate the VAR, try to determine a value which is close to the VAR and start to build up a database so the VAR can be calculated in the future. This chapter gives an overview of the characteristics of risk calculations of the main risks of loss; details on the calculation of risks can be found in the different worlds of the book.

Credit risk

Credit risk arises from the failure of a borrower which means that loan repayments and interest payments cannot be paid. The deterioration in a borrower's creditworthiness (rating migration) represents credit risk as well, as probability of default increases.

The main factors influencing the credit risk are:

EAD (Exposure at default) The outstanding amount of a balance sheet loan naturally is the loan's book value; the EAD of credit lines depends on their probable utilization according to the confidence interval; the EAD of derivatives depends on the volatility of (positive) changes in value. The credit risk of derivatives is referred to as the replacement risk.

LGD (Loss given default): The LGD indicates the percentage of the EAD which is lost in the case of default. The percentage rate depends on the loan's seniority and the collaterals assigned. Alternatively, the LGD can be evaluated separately for the unsecured part of the loan and the collaterals. The LGD equals the EAD minus subsequent repayments (1 – recovery rate). The recovery rate is calculated bases on historical repayments: expected values and confidence intervals again define the range of possible recovery rates.

PD (probability of default): The PD gives the probability that a borrower defaults within a certain period of time. Ratings state the probability of default for each borrower.

The **expected loss (EL)** is evaluated based on the three influencing factors mentioned.

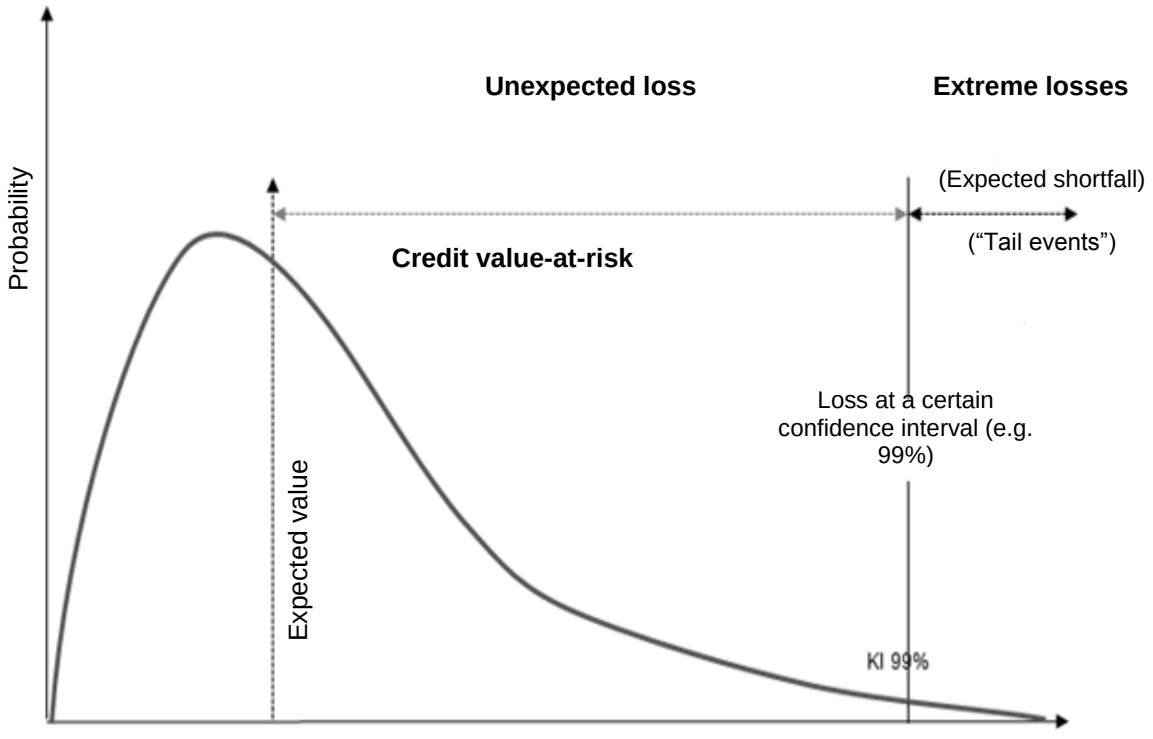
EAD * LGD * PD = Expected loss (EL)

Example: 100 * 45% * 1% = 0.45%

In the lending business expected losses are offset as standard risk costs in order to ensure that defaults and deteriorations in creditworthiness of borrowers are covered in the credit portfolio.

As the expected loss represents a long-term average, we need to estimate by how much losses could be exceeding the expected value in the ICAAP, which is done based on the VAR calculation.

Calculating the VAR of credit risks is done by using a special distribution curve which does not correspond to normal distribution. As losses exceed possible profits, positive and negative deviations from the expected value cannot be symmetric. One the one hand the situation cannot be better than “no default” whereas on the other hand we can lose the total amount of credit exposure.



The **unexpected loss** is evaluated by calculating the difference between the risk value determined based on the confidence interval and the expected value. Banks need to ensure risk coverage for unexpected losses. The area outside the confidence interval (expected shortfall) is or can be much larger than it is with the normal distribution.

When calculating the credit risk, a credit's term (the risk of default is greater for long-dated loans than it is for short-dated loans), the correlation (mostly between countries and sectors) and the holding period (the calculation is based on the assumption of 1-year holding period) are taken into account in addition to the parameters mentioned above.

The legislature has specified a procedure under pillar 1 (minimum capital requirement) which is referred to as the "standardized credit value-at-risk". Depending on the model's complexity more ore fewer parameters are estimated from the key figures of the bank's portfolio:

Standard approach: Capital adequacy is determined on the basis of the borrower segment and external ratings of actual credit portfolios. The application is only done under pillar 1, as the banking supervision demands at least validated bank internal PD-estimations under pillar 2.

Internal rating based approach (IRB): PDs are calculated based on the historical default experiences a bank has made; the LGD recovery rate has to be estimated. In order to calculate the capital adequacy, "through the cycle-oriented PDs" need to be used i.e. the highest default rates within an economic cycle are used instead of the expected value.

Advanced IRB approach: The bank needs to estimate the recovery rate. The banking supervision requires the use of stress values instead of expected LGDs for calculating the capital adequacy.

Credit risks include structural risks which do not represent direct risks of loss and must thus be managed by using separate methods (processes, limits). Such risks are:

- **Concentration risk or cluster risk:** Risk accumulation in certain instruments or sectors.
- **Country risk:** Concentration of risks in a certain country.
- **Large exposure risk:** Credit risk caused by a group of related companies.

These risks must be described by their impact in the risk policy; limits need to be fixed in the risk strategy. Calculating the credit risk by using the CVAR does not take the concentrations mentioned into account, as the method assume that loans are equal.

In addition to guidelines and credit limits, stress testing can help to find concentration risks within the bank.

In the ICAAP we stress the bank's ability to carry and sustain risks by using the CVAR of the entire lending business. As banks need to do stress tests, risk coverage buffers should be able to absorb the consequences of stress events.

Market risk

Market risk represents the risk of losses due to market movements.

The main market risks are:

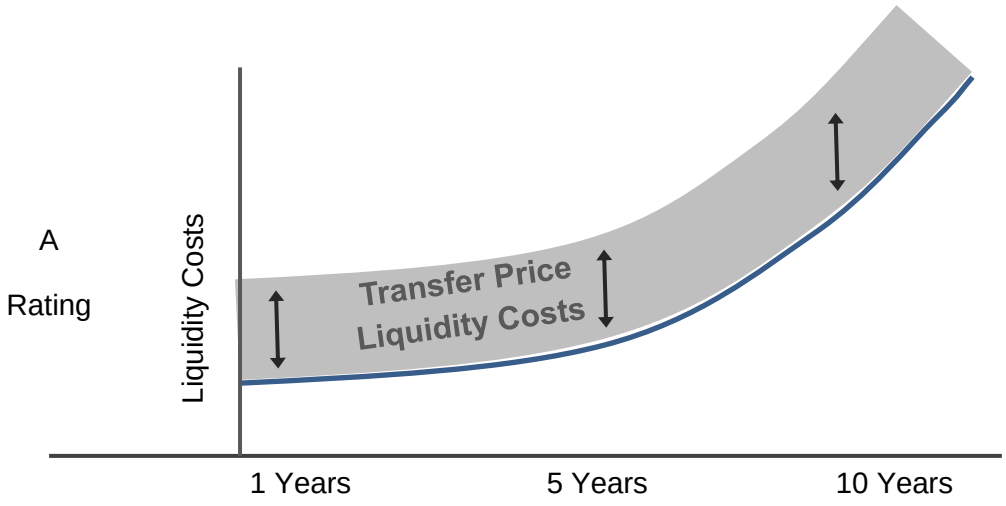
Interest rate risk: The interest rate risk is the risk of losses due to changes in interest rates, a yield curve twist or basic risks resulting from situations in which interest rate positions with the same term behave differently (e.g. EONIA/EURIBOR).

Measuring and managing the interest rate risk is often done on accrual basis meaning that we focus on the risk that the interest margin narrows, as short-term interest rates change. According to the ALM, we focus on reducing the interest risk contribution (earnings at risk) and limiting the existing interest rate positions (GAP limitation).

The VAR needs to be used again for the ICAAP and the economic analysis. It is essential to take the interest rate position's term into account when calculating the VAR which is done by using the modified duration or the present value basis point (PVBP): The present value price sensitivity of an interest rate change with a term of 1 month does not match the one of an interest rate change within a term of 5 years. The VAR thus gives the consequences of price movements (= changes in interest rates * price sensitivity in accordance with the respective term).

As the VAR can only be used to limit the overall loss, it is essential to make use of other instruments when managing interest rate positions to prevent risk concentration within certain maturity bands, currencies and instruments. This is usually done through PVBP limits which can be matched with the VAR.

Liquidity cost risk: We assume a situation in which a bank is still able to ensure that follow-up financing and hedging of open positions can be done – as soon as this point is passed the contingency funding plan is used and risks of loss are replaced by the structural risk of illiquidity.



The risk calculation thus is based on the volatility of liquidity costs and the costs of open positions assuming that positions are closed under unfavourable conditions.

The calculation result which represents VAR liquidity costs are taken into account when doing the ICAAP calculation.

Credit spread risk: It measures possible losses of security positions assuming changes in credit spreads whereas creditworthiness remains the same. If the creditworthiness changes, the resulting risk is interpreted as credit risk (migration risk).

Credit spreads represent the premiums charged for risk-free interest rates (asset swap spread). The premium's volatility has to be managed by the bank as it is done with interest rate positions.

When measuring the credit spread risk, we take into account the term, the creditworthiness, the segment of the instrument and related correlations. The data base's complexity becomes a challenge when doing risk measurement, especially for small portfolios. Calculating the risk following the trading book standard approach stated in Basel 4 can therefore be used.

A credit spread risk value is required for the ICAAP; the bank's management has to ensure an optimal risk measurement, the ALM is responsible for managing the credit spread risk.

Currency risk: The currency risk is evaluated by using the VAR approach. Volatility calculations are based on daily prices and currency fluctuations, correlations are determined on the basis of daily prices of all currencies and assuming a normal distribution (the probability of a short-term rise in prices equals the probability of declining prices) which is true for spot transactions.

As the currency transaction indirectly represents a forward and option transaction, it becomes hard to calculate risks using the VAR. The assumption of a normal distribution, especially for the “tails”, is not true anymore, as specific risks associated with options (particularly Gamma but also Vega) are not measured.
Thus the risk of currency transactions involving a lot of options is evaluated by using the historical simulation or the Monte Carlo simulation. This applies for all market risks which involve a certain number of options and structures (which contain options as well).

Equity risk: Risk measurement and management is similar to the procedure used for currency risk including dividend payments.

Other price risks: A bank usually enters risky gold and commodity positions as they play a major role both in the customer and the fund business. Additionally, new markets are found with the electricity trading and the trading of the emission certificates. Other price risks are hardly used for managing the bank boos as such risks are mostly used for managing the trading book.

Operational risk: The operational risk represents the risk of losses resulting from the failure of

- Employees
- Internal processes
- Systems (IT)

Computer failure for which no adequate organizational preparations have been made, damage caused by criminal acts, legal costs or the lack of consulting expertise among the employees are common operational risks.

Risk measurement is done based on historical events of damage (advanced measurement approach) or standard approaches fixed by the legislature if the damage base is not big

enough or hedged. The operational risk consists of a lot of small losses and few large losses which causes that needed risk buffers usually exceed the expected value.

Business risk: The business risk refers to the risk-free customer margin in the ICAAP.

Historical volatilities, possibly per business segment including correlations between the results of business segments, can be used for calculating the risk for the customer margin. Short time series, methodical calculation changes as well as the influence of forward-looking investment decisions are just the beginning of methodical problem arising when measuring the business risk.

Macroeconomic risks: The macroeconomic risk can only be evaluated based on one or better yet more macroeconomic scenarios (basic scenario, downturn scenario, stress scenario). The scenarios fixed need to be applied systematically in all the stress tests: Thus the scenario developed for interest rate and credit spread changes has be taken into account equally both in the ICAAP and when calculating the haircuts of liquid assets in the liquidity risk calculation.

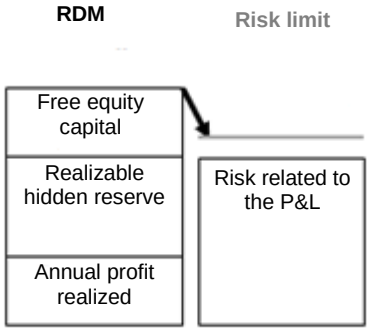
The macroeconomic risk represents the difference between the “normal” ICAAP risk calculation (e.g. 99.9% confidence interval) and the macroeconomic scenario’s impact. This calculation has to be made based on the downturn scenario, as the stress scenario‘s result needs to be evaluated per quarter, separately from the ICAAP (article 286 CRR iVM CEBS guidelines on stress testing (GL32)).

All risk-relevant risks of loss need to be measured and limited by the bank in order to ensure risk coverage. The amount of risks taken as well as the targeted return is defined in a bank’s risk policy and strategy. Settings for the size of limits of different risk types and business segments can also be found in it.

ICAAP

The ICAAP (Internal Capital Adequacy Assessment Process) represents the base for the total bank management: We start by adequately measuring all significant risks. Besides answering the question whether the quality of risk measurement is ensured (mostly VAR measurement which includes not only sufficient confidence intervals, holding periods and data quality, but takes optionalities into account) and determining the overall bank risk, the following three views of risks must be applied and put against the respective amount of risk coverage in the ICAAP:

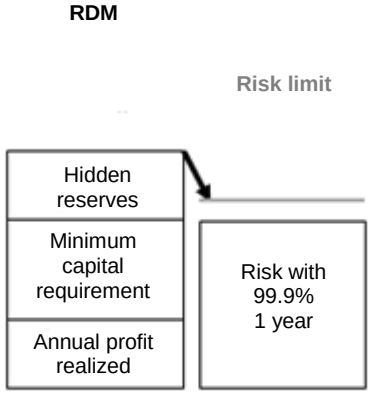
Going concern



Going Concern:

Aim: Ensuring a minimum annual result in order to ensure that minimum capital requirements (banking supervision) are met and to maintain a certain level of financial scope (supervisory board). Risk point of view: Risks related to the P&L need to be measured Holding period: year end (YE) and 1 year *"The aim of going concern approaches is to ensure the institution's survival even if losses occur over the risk horizon. Since such survival is predicated on the fulfilments of the pillar 1 regulatory own funds requirements, it is necessary for institutions to set aside the requisite capital components for pillar 1."*[6]

Liquidation approach

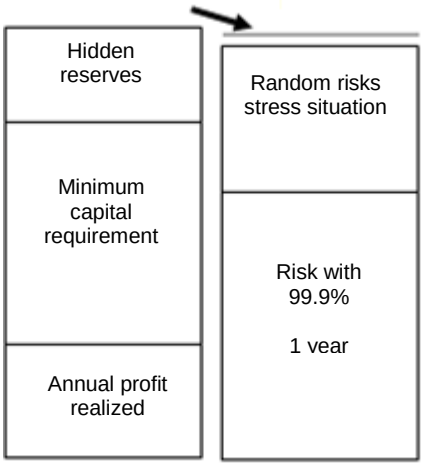


Gone concern – liquidity:

Aim: Ensuring financial coverage for providers of equity capital in risk situations Risk point of view: Present value – VAR Holding period: 1 year, except for trading books *"By contrast, gone concern approaches do not focus on protecting proprietors but rather creditors. The aim of such approaches is that, even in extremis, i.e. if all of the risk factored into the management of internal capital adequacy materialize, the institution's creditors can be paid from what is left of the institution's assets, thus shielding them against losses."*[7]

[6] See monthly report of Deutsche Bundesbank, March 2013, page 32
[7] See monthly report of Deutsche Bundesbank, March 2013, page 32

Stress situation



Gone concern – stress scenario:

Aim: Ensuring financial coverage for providers of equity capital in stress situations

Risk point of view: Present value – stress value-at-risk (SVAR) or statutory capital adequacy when higher Holding period: 1 year, except for trading Books.

Risk measurement methods commonly used are summarized in the following table for the 3 perspectives of the ICAAP:

Bank book	Going concern	Liquidity	Stress
Credit risk + shareholder risk	Risk of specific provisions (PD risk + LGD downturn) Alternative: Upscaling of liquidity approach to 95%	IRB approach or credit VAR 99.9% (including CVA)	IRB approach including stress PD
Interest rates	Accrual risk + valuation risk for P&L results with the VAR 99.9%; 1 year Alternative: Upscaling of liquidity to 95%	VAR 99.9%; 1 year	SVAR 99.9%; 1 year
Credit spread	Valuation risk CSVAR 99.9%; 1 year	CSVAR 99.9%; 1 year	SCSVAR 99.9%; 1 year
Shares	Valuation risk VAR 99.9%; 1 year	VAR 99.9%; 1 year	SVAR 99.9%; 1 year
FX	VAR 99.9%; 1 month	VAR 99.9%; 1 year	SVAR 99.9%; 1 year
Risk of liquidity costs	Accrual risk + valuation risk for P&L results with the VAR 99.9%; 1 year	VAR 99.9%; 1 year	SVAR 99.9%; 1 year
Operational risk	Derived from historical maximum possible loss Alternative: Scaling according to the legislature	Statutory regulations or internal models	-
Business risk	Historical contribution volatility	-	-
Macroeconomic risk	-	-	EBA scenarios for stress scenarios

Total trading book	Going concern	Liquidity	Stress
	VaR 99.9%, 10 days Alternative: (stop loss) * factor	VaR 99.9%; 1 year	SVAR 99.9%; 1 year

1.5 Measurement of Performance in the ALM/TBM

The core of bank management is Transfer Pricing. Transfer prices express the expenses/ revenue of a risk hedge in the financial markets. Transfer prices are calculated separately for the following banking risks: credit risk, interest rate risk, liquidity cost risk, credit spread risk, FX and equity risk.

Identical risk positions should always have the same transfer price applied (thus, 3 months interest rate positions have always the same 3 month interest rate-transfer price). The transfer price determines the risk position (s. Chapter 4). Any deal concluded utilises the same transfer in the performance calculation. Transfer prices separate the interest income into customer contribution and risk business (ALM) performance:

Accrual, Present Value and ToR

Transfer prices are the basis for the performance calculation in ALM/TBM: Income and expenses from all on- and off-balance sheet transactions are recognised at transfer prices and lead to the accrued ALM result – which is interpreted as performance of the ALM:

Earnings effect of market risk

Interest rate risk: interest revenue minus interest expenses at interest transfer prices

Liquidity cost risk: Liquidity risk revenues (that are calculated for the lending business on the asset side) minus liquidity risk expenses (the liquidity premiums attributed to the liabilities side) at transfer prices

Credit spread risk: credit spread margins from long and short positions at transfer price

Credit risk: all (standard) risk costs charged to the customer business minus defaults

The performance ALM calculation ends up in an accrued year-to-date (YtD) result that is part of the total P&L result. The total result of P&L should be explainable with the customer margins plus the risk contribution. By calculating the ALM results as a difference between total P&L result and the customer margins, the reconciliation of the results and the analysis

which risk positions lead to which result cannot be performed. As a consequence the basis to deduce management decisions for the risk position is missing.

The accrual performance of ALM is referred to as Gap Contribution. It is divided into a gap contribution for interest-, liquidity cost-, credit spread- and credit- risk. In addition to the accrual result the total P&L result of the bank will be influenced by the results of financial instruments that are valuated with their current market prices in P&L. These mark-to-market valuations are shown in the P&L position “valuation results”.

So we can state that accrual is consistently being included into the ALM’s performance, in the P&L mark to market (=present value) is included only for specific positions. However, a consistent **present value perspective** has to be adopted if the economic result of ALM (and TBM) should be transparent. We showed in chapter 4 that this view is the view of risk management. “What are the costs if I have to close all positions with unfavourable rates?” is the question in risk management.

The present value question also matters in the performance view. “What does it cost/ what do we earn if all risk positions are closed at current rates?” is the performance question.

In case of price products (FX, equities) nobody would contradict. But with interest rate products the argument is "it depends on whether I want to keep the position until the end of the term or whether I decide to sell/close them prior to maturity. The argumentation for loans is even stronger: for loans that cannot be sold/unwound before maturity the present value is a purely theoretical point of view. In case of derivatives that are used to hedge the risks of customer business the aim will be to have the same valuation concept for these derivatives then for the underlying business.

	GAP CONTRIBUTION PERSPECTIVE	PRESENT VALUE METHOD
Conclusion:	How much does the bank earn out of risk transformation with an unchanged balance sheet structure within one year	What does the bank earn if today all positions are closed (revenues and expenses are discounted to today)
Time period considered	The analysed period only	Total term of the position
Risk situation	Maintenance of prevailing risk structure	Closing of risk
Impact of market rate changes	Variable positions are revalued, with new rates, fixed positions remain unchanged	All positions are compared to the new revenues / expenses when hedged / closed

This raises the question about transparency in performance measurement: accrual only? Present value only? Sometimes accrual, sometimes Present Value?

Economically correct is the so called “Total Return” perspective (TOR): Accrual YtD plus present value change since the last valuation. Total return considers all accrual expenses and revenues that have occurred since the last valuation date plus what a buyer of the risk position would pay or charge for the risk positions with the current market rates. Always under the assumption that the risk position can be sold, closed or reversed – an assumption that is included in the transfer price concept. A performance calculation without present value means that risk positions remain open and that their positive or negative market value is integrated in the future performance.

Performance Measurement Present Value

	01.01.	**31.12**			
Interest rate money market	5%	4.50%			
Interest rate capital market	6% (5y)	6.50% (4y)			
Credit spread	0.44%	0.60%			
Liquidity costs	**1y**	**2y**	**3 y**	**4y**	**5y**
01.01.	0.05 %	0.11 %	0.18 %	0.24 %	0.30 %
31.12.	0.08 %	0.15 %	0.23 %	0.28 %	0.35 %

Duration	1 year	0.96
	2 years	1.90
	3 years	2.70
	4 years	3.60

After one year the market rates change. This is not recognised in the accrual view but in the Total Return Perspective.

Performance in ALM

Assets		3 months	4 years	Total
	Volume		100	
	Transfer price		6.0	
	Valuation rate		6.5	
	Result MTM		-1.80	-1.80
Liabilities	Volume	100		
	Transfer price	4.5		
	Valuation rate	4.5		
	Result MTM	---		---
			Change MTM	-1.80
			+ Accrual	+1.00
			= Return	-0.80

In the first step the assets and liabilities are valued with the valuation interest rate at 31st Dec. The residual term is 4 years. On the liabilities side, the transfer price and valuation rate are reset, so the MTM valuation is zero. On the asset side, there is a rise of market rates by −0.5% which impacts a present value effect (−0.5% * 3.6 (duration 4 years)) of −1.80%. The accrual result (6% − 5%=1%) and the change in present value thus lead to a Total Return on the interest risk position of −0.80% (or with a volume of 100 −0.80).

Liquidity Risk

Assets		1 year	2 years	4 years	Total
	Volume			100	
	Liquidity premium			0.30	
	Valuation premium			0.28	
	Result MTM			+0.072	+0.072
Liabilities	Volume	50	50		
	Transfer price	0.11	0.15		
	Valuation rate	0.08	0.15		
	Result MTM	-0.014	---		-0.014
				Change MTM	+0.058
				+ Accrual	+0.220
				= Total return	+0.278

TOR for liquidity risk is calculated in the same way than for interest risk. By way of reminder, as shown in the example in chapter “The Transfer Price as the Foundation of ALM”, for the liabilities side we assume a 2-years moving average of liquidity that must also be considered when calculating the mark-to-market result.

Result MtM assets: +0.02*3.6 = 0.072

Result MtM liabilities: 0.5*(−0.03)*0.96 = −0.014

Credit risk contribution

Rating	AAA	AA	A	….	Total
Volume			100		
Credit spread			0.44		
Market spread			0.60		
Return MTM			-0.576		-0.576
				Accrual	+ 0.140
				= Total return	- 0.436

Also the credit risk performance is composed out of the accrual (0,44−0,30; see example in chapter Transfer Prices). For calculating the present value a 4-years duration applies and a change in market prices of 0.16, leading to a MtM result of −0.576. (−0.16 * 3.6 = −0.576). Total Return of YtD: −0,436 (+0,140−0,436).

Summary

To illustrate the different interpretations of the results the accrual contribution of the ALM gaps, Mark to market and total return for the bank are compared. Whereas accrual shows a positive result, Total Return shows a negative performance from the risk/ALM business.

	Accrual	MTM	Total return
Interest rate risk	1.00	-1.80	-0.80
Liquidity risk	0.22	+0.058	+0.278
Credit risk	0.14	-0.576	-0.436
Σ	1.36	-2.318	-0.958

ALM Performance measurement with the Total Return concept implies that risk measurement, limits and performance are consistently based on MtM valuation AND accrual.

To only consider accrual gives an incomplete picture. From this point of view it is difficult to understand why in practice hardly any bank plans and manages its ALM consistently on a TOR basis.

A major explanation for this accrual driven ALM performance measurement may stem from accounting rules: Even an extremely positive TOR does not help the board members of a bank if it is not shown in the P&L statement and the annual/ quarterly report. And if present value losses occur – who would like to record a negative P&L, especially if banking book positions will be held until maturity? For many buy and hold positions a once negative present value will never materialise. Why should value fluctuations be reported in short term reports if this reduces the confidence of stakeholders? However, all these arguments do not mean to close the eyes in front of risk: Risk measurement definitely has to be based on a present value view. Banks should limit their risks with their risk bearing capacity – within a present value view (like VaR) as it is required by the ICAAP.

The ALM/TBM practice is of course not black & white. The gap contribution of the banking book that is composed of out of interest rate, liquidity cost and credit spread components normally is shown on an accrual basis and not on a MtM basis. Exceptions to this are derivatives which are always shown with their present value as well as bonds in the banking book that are “available for sale” (for example, because they are in the liquidity portfolio that must be sellable by definition). The performance of all Trading book positions should be measured with MtM (present value) and accrual (= Carry).

As a consequence in common practice ALM performance measurement differs from

Total Return in the following points:

a) The MtM effect of risk positions out of customer business are NOT shown in the ALM result.

b) Bonds in the investment-book are partly calculated accrual only (buy and hold assumption).

c) Derivatives are calculated on a MtM basis even when they serve as a hedge of customer business or buy and hold bond positions. In this case the underlying position is valued accrual, the hedge instrument (IRS) on a TOR basis.

Ad a) As customer business is not valuated MtM in the profitability accounting, it seems consistent that the corresponding risk positions in ALM are not calculated MtM either.

Ad b) Even if bonds performance is not reported with its MtM changes in the P&L, ALM will report and manage all bond positions on a MtM basis. As a consequence the whole

investment book is managed on a TOR basis. ALM decisions normally take into account the dual view: economic decision making vs. P&L driven decision making.

Ad c) In order to solve the asymmetric valuation of underlying and derivatives “hedge accounting” has to be implemented.

P&L Valuation and IFR Hedge Accounting

Below the example of the previous chapter is continued and adapted to show the impact of valuation. We show the performance impact of a hedge of the underlying credit position with an Interest Rate Swap after one year with and without hedge accounting.

It is decided to hedge the interest rate risk of a 5 yrs fixed rate customer position with an interest rate swap:

Fixed rate payer Interest rate swap (IRS): 5 years 6.00% against 3 months

The following market data applies:

	T0	T1
Interest rate money market:	5.00 %	4.50 %
Interest rate capital market:	6.00 %	6.50 %

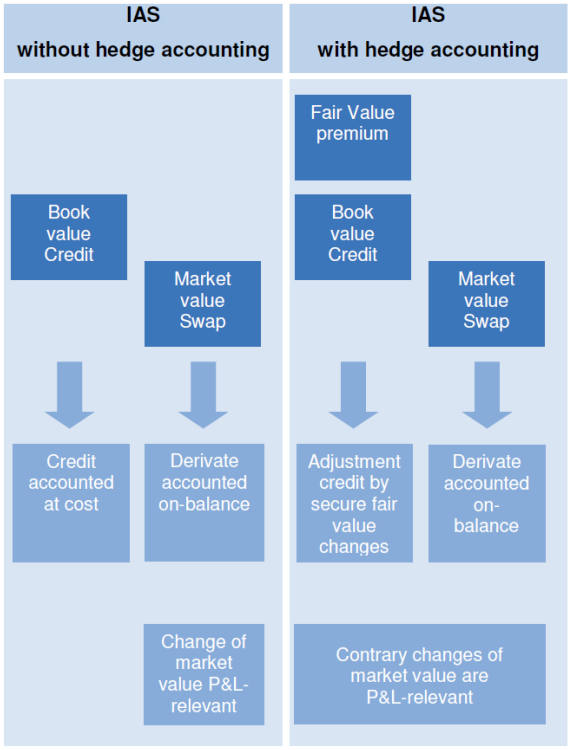
With hedge accounting the underlying and the IRS assigned are shown on the same basis of performance calculation (which is ToR). Without hedge accounting an “accounting mismatch” would occur as the underlying would be valued at cost and the IRS would be valued MtM.

	Accounting mismatch		With hedge accounting	
T0	0		0	
T1	**Hedged item**	**Swap item**	**Hedged item**	**Swap item**
	Accrual	ToR	ToR	ToR
Interest Earned	+6.00	+4.50	+6.00	+4.50
	-4.50	-6.00	-4.50	-6.00
Accounting	-	+1.80	-1.80	+1.80
Impact	+1.80		0	

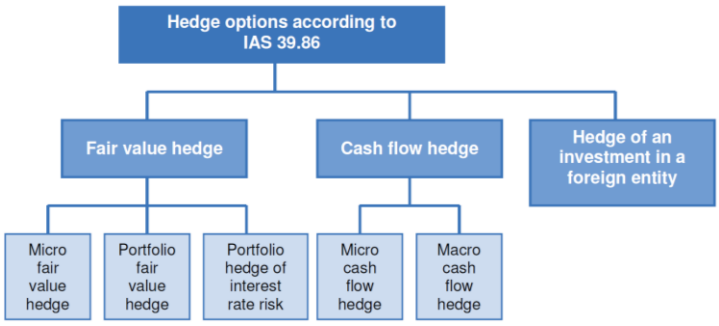
As it can be seen in the example hedge accounting allows to stabilise the results even if rates change (for simplification purposes the demonstrated results only take into account the

ALM risk position at transfer prices). Referring the valuation result of 1.80 the calculation may be retraced with the calculations shown in the part TOR interest result.

Using hedge accounting all positions in a hedging relationship are shown as with their TOR in the P&L statement. In case of a perfect hedge the change in values of the hedged item and the hedging instrument perfectly match and the net impact of changes in market rates is zero.



IAS 39 distinguishes between three types of hedges (IAS 39.86) and each can again be divided into sub-categories.



Outlook: with IFRS 9 (to be applied at the latest starting from 1.1.2018) the categories Fair Value Hedge and Cash Flow Hedge as well as the accounting classifications of IAS 39 are unchanged.

Micro hedge

In case of a fair value hedge the hedging derivative is measured at fair value and affects directly P&L. Thus, there are no differences compared to the common accounting rules.

To achieve the desired compensation effect in the financial statement, the valuation result of the hedged risk of the underlying has to be taken into account in P&L too. If it is an instrument of the category “available-for-sale”, it merely requires the transfer of the result from “other comprehensive income” (not P&L relevant) into the P&L statement (valuation results). For financial assets/liabilities valuated at (amortized) cost, an additional P&L relevant MtM valuation (for the hedged risk) has to be booked. The offsetting entry is affecting the net result and provides the desired compensation in the P&L statement. Overall, it can therefore be concluded that the compensation effect is achieved by adjusting the accounting treatment of the underlying transaction to the hedging transaction.

A cash flow hedge is based on the intention of hedging profit or loss against future P&L relevant cash flow fluctuations. Like the fair value hedge, the cash flow hedge wants to hedge a specific risk. However, while the former focuses on hedging the fair value of the hedged item, the latter one is trying to hedge the related cash flows of the hedged item.

With regard to the accounting treatment for cash flow hedges, the following should be noted: while the “value compensation” is achieved at fair value hedges through an adjustment of the treatment of the underlying to the hedging instrument, for cash flow hedges the treatment of the hedging derivative is modified. This is, as usual, accounted with its fair value on the balance sheet, but the hedge efficient part of the result in shown in equity whereas the inefficient part of the hedge is P&L relevant.

Macro hedge

In addition to the above described micro hedge accounting, two options for the accounting of hedging relationships on a macro level exist. In this case, the two above mentioned hedge accounting principals are transferred from a micro to a macro level.

The portfolio fair value hedge enables the hedging of a portfolio of financial assets and liabilities against interest rate risks. The bank has to determine the net exposure of the portfolio of assets and liabilities and the amount to be hedged.

A cash flow hedge is pooling aggregated cash flows, rather than a single underlying transaction, for defined term bands and assigns appropriate hedging instruments to each of these term bands.

For ALM strategies it will therefore be crucial to define in advance the possibilities to manage the risks, to identify potential accounting mismatches and to incorporate the corresponding portfolios in the hedge accounting.

Thus, undesirable P&L volatilities can be avoided. Every ALM strategy has to be checked regarding its P&L impact. If performance volatility promises to be high – hedging strategies have to be developed with accounting in a lead position and ALM insisting that a solution can be found.

1.6 Organisation of ALM/Total Bank Management (TBM)

The ALM/TBM-Committee is a decision committee that, under consideration of the market view, manage the market risks in the banking book. ALM therefore can be defined as the management of the Interest-, Liquidity cost-, FX-, Credit-Spread and other risks of the banking book.

TBM has the duty to manage credit risk and capital allocation with risk/return criteria. The responsibility for results and the managed risks is allocated at the ALM-, or the TBM committees.

The decisions of the ALM committee (and partly even TBM committee) are implemented by the ALM department.

Organisation and Duties of the ALM/TBM-Committee

A bank's banking book is managed by one or more Committees. As a minimum representation one board member from the market organisation (Treasury, Financial Markets) and one board member of the non-market organisation (CFO, CRO) are necessary to allow the committees to take decisions.

For the management of all market risk and short term liquidity risk normally answers the ALM-Committee. Instead of ALM Committee (Asset-/Liability-Management) the term ALCO (Asset-/Liability-Committee) is used frequently.

Responsibility for the management of a bank‘s capital allocation takes the Total Bank Management (TBM) committee. The TBM builds on the ICAAP process and derives limits for all ICAAP risk in all business lines. Starting with approval of the bank's Risk Policy and -Strategy and mid-term planning of risks and earnings bFtry the supervisory board TBM-limits have to correspond with the bank‘s strategy. Limits have to be funded with capital – limits determine the capital allocation.

Within bank organisation TBM frequently is a separate Committee. It can also be part of the ALM-Committee. A third form of organisation that we find in bank's practice is a Strategic Risk Committee. The pros and cons of these versions were discussed in chapter 2.

In this handbook we discuss ALM and TBM as two committees that meet subsequently and where the ALM committee's members are also members of the TBM committee. TBM has an

enlarged participation: key management (board members) of the business lines should be present.

	ALM Committee				TBM	
Decisions		Directors Financial Market	Directors Finances/Risks		Customer-directors	
Preparation/ Execution	**ALM** Moderation Operative Execution	**Treasury** Market Access Market Opinion	**Risiko-controlling** Risiko-messung Limite	**Accounting/ Controlling** P&L statement Bilanz-Kennzahlen		Division Manager Customer Business

If the committees number of participants should be enlarged this should only be done after clarifying the potential member´s tasks and responsibilities. Otherwise ALM and TBM committees tend to become too big for fast decision making (committee‘s meetings typically do not exceed 1−1.5 hours.).

For taking decisions on market risk the ALM/TBM Committee has to fulfil the following duties and responsibilities

ALM Topics
ALM profit analysis
Interest and capital tie up balance p.m.
Variance Analysis ACT vs. last month (interest risk, liquidity cost risk , credit spread, FX, shares)
ALM – risk analyses
Risk development and utilisation of limits
Risk analyses going concern: earnings at risk (Interest, Liquidity Cost, Credit Spread, FX, Shares)
Market forecast
Market rates (TP) forecast up to the next ALM-Committee meeting
Market rates forecast Yearend and 12 months

Comparison of forecast an Forward Rates
ALM management decisions
Hedging of market risk conforming to Risk Policy and -Strategy
Decisions based on market-rate forecasts including motivation for the decision and documentation of expected results
Conform to Regulation and supervisory demand
Immediate reaction on limit breaches

TBM Topics
Proposal of Risk Policy
Implementing Principles for risk policy
Decision on Risk limits
Proposal of Risk Strategy
Implementing Risk / Earning targets per business segment
Decisions on an ongoing basis
Setting Mile stones
Mid-term planning incl. planning of risk resources
Review of quality and completeness of risk measurement
Reports on all relevant risks – analyse of risk bearing capacity
Risk / earning reporting for the business segments incl. Financial Markets (ALM and Treasury) plan/actual deviation
Decisions on re-allocation of the risk and capital in order to achieve the bank´s risk/earning targets

The department ALM, which is preparing and implementing the ALM/TBM decisions following and between the committee meetings, has to following duties and responsibilities:

ALM Department tasks in support of ALM/TBM committee
Preparation and follow up of ALM meetings (min. 12 x p.a.)
Preparation and follow up of TBM meetings (min. 4x p.a.)
ALM
Profitability analysis ACT vs. last month
Interest
Liquidity
Credit Spread

FX
Shares
Update FYE for all market risks
Coordination of forecast of market rates as a basis for transfer prices
Interest
Liquidity
Credit Spread
FX
Shares
Proposals and coordination of ALM decision making
Positioning of Interest-, Credit Spread and Equity risk
Detailed measures for liquidity management (Positioning and HLA Management)
Detailed measures for FX
Proposals for changing limit
TBM
Analyses
Profit and risk-/earnings analysis per business segment (compared with last quarter)
ICAAP analysis (compared with last quarter)
Performance of key figures and ratios
Proposals and coordination of TBM decision making
Measures to change equity allocation (customer business and if possible financial markets) between the business lines
Measures to bring ICAAP risk within the targeted limits
Measures to optimise capital use (collateralisation, follow regulatory intentions,..)

Ad hoc basis
Required action due to regulatory changes concerning ALM/TBM management
Status report on product introduction process (PIP) regarding ALM/TBM relevant products
ALM handbook updates
Required improvements of the ALM data base
Coordination and documentation of the risk policy and –strategy for supervisory board approval
TBM
Risk/earnings oriented planning of balance structure including key rations
Moderation of ALM and TBM meetings
ALM/TBM
Preparation and coordination of committees meetings documents
Minutes of the meetings
Coordination of the implementation of the committees board decisions
Advancement of reporting templates
Organisation of extraordinary – ALM meetings and circular decisions

Current Tasks of ALM Department
Daily liquidity management
Management of operational liquidity
Create and keep access to ECB financing
Commissioning of repo transactions to place or fund liquidity
Collateral and asset encumbrance strategy and implementation
Short term liquidity management measures incl. LCR/HLA management
Total bank planning and implementing long term liquidity strategy decided by TBM
Consideration of the liquidity cost risk within the funding strategy of the bank
Managing liquidity puffers and the required quality levels
Comply with regulatory minimum standards for the contingency funding plan
Comply with internal liquidity limits

Responsibility for Liquidity management
Elaboration and proposal of liquidity risk strategy to the ALM committee
Liquidity strategy for the single bank and (if existent) the group
Response to regulatory liquidity risk management requirements
Elaboration and implementation of the liquidity contingency funding plan
Collaboration with Controlling in developing and modelling Transfer Prices;
Collaboration with Controlling in modelling the capital-tie-ups (normal case and stress)
Market Risk management in banking book
Contribution of market analyses, coordination of the bank´s market price forecast and preparing the reports for managing the market price risks within the ALM committee
Management of market price risks (interest, liquidity costs, credit spreads, FX, shares) in line with the guidelines of ALM Committees
Asset Allocation for the investment book in line with the Committee's guidelines
Execution of hedging measures in line with the ALM-Committee decisions
Consideration of IFRS Hedging Rules in line with the hedging strategy
Generate profits in line with ALM committee´s decisions and the budget
Ongoing monitoring of market risks limits
Comply to market risk relevant key figures
Processes and organisation in ALM
Lead in the PRIP (product introduction process) of financial products
Collaboration in the design of IFRS hedging strategies for the banking book
Proposals and collaboration in modelling transfer prices and capital-tie-ups
Design and ongoing improvement of ALM committee´s reports
Capital management
Budgeting and planning of regulatory capital (single bank and group)
Budgeting and planning of economic equity (ICAAP) (single bank and group)
Regulatory Watch regarding capital topics
Proposals and coordination of capital re-allocation measures to be decided in TBM
All capital arrangements are planned on group level

Proposal and coordination of measures to optimise risk/return and capital usage within business lines
Proposal for total bank risk allocation in order to achieve budget and planning targets

Frequency of ALM management is higher (at least monthly) than for TBM management (quarterly). Regulatory guidelines require banks to measure and manage risks in the banking book on a daily basis (EBA Guidelines on common procedures and methodologies for the supervisory review and evaluation process (SREP), EBA/GL/ 2014/13, 19.12.2014, Title 6.3 Assessment of market risk: Risk identification, measurement, monitoring and reporting, numeral 227 und Principles for effective Risk Data Aggregation and Risk Reporting, BCBS 239, Jan. 2013, Principle 10, Par. 71). At least monthly profitability reporting on customer business and daily profit/loss reports on the banking book is market standard. In total bank management, where decisions for equity allocation are felt, often this management is in accord with the quarterly statement.

Efficient frequency of committee meetings depend on the way the management decisions are organised between the meetings: Since competences of the ALM department in entering into market transactions on its own are restricted, unexpected market movements will result in an extra ALM meeting, or if foreseen by the committees rules of operation, a circular decision. So ALM meetings normally take place at least once a month. TBM decisions are less triggered by market movements and limits as it is with ALM‘s market risk. Decisions depend more on the bank’s ongoing business. Reporting of customer business frequently is performed on a quarterly basis. Therefore TBM decisions interfering with the bank‘s capital allocation will normally have quarterly rhythm with the chance of a higher frequency whenever an ALM committee's meeting is taking place.

Rules and Regulations of the ALM/TBM-Committee

The framework for committee work is defined by its rules and regulations. The following basic bullet points define members, tasks and competences in the ALM and TBM committees:

Members and Decision Making
The members of the ALM-Committee comprise: one board member of market organisation (treasury, capital market, markets) and a board member of nonmarket organisation (CFO, CRO). In addition heads of the ALM department, risk-controlling, revenue-controlling and accounting.
The TBM Committee will comprise all board members and the key division managers of the business lines.
Any committee may invite guests upon special topics.
Voting power is restricted to the board members with majority decisions and the casting vote with the head of the committee (either board member markets or board member risk). All ordinary members have the right to make motions.
Ruling on deputies and representations.
Regulation on circular decisions between the meetings (usually a minimum one committee member from the market organisation and one committee member of the non-market organisation are required).
Procedures for organising extraordinary meetings (either triggered by predefined event or by the proposal of an ordinary committee member).
Meeting frequency, normal case: ALM-Committee monthly or shorter; TBM Committee quarterly.

Duties and Competences
The ALM-Committee is managing the interest-, liquidity cost-, credit spread-, FX- and share price risks on total bank level within specified limits. A special focus is on total bank liquidity management in order to fulfil the relevant pillar 1 and pillar 2 specifications in CRR.
The TBM-Committee implements the ICAAP based risk-/return policy- and strategy on total bank level. It complies with the duties of care Art. 107 with Art. 97 and 76 to 87 CRR. Its responsibility is to limit total risk to the risk bearing capacity of the bank and to install a risk category and business line oriented approach thus managing a process that assures adequate capital for the bank. The focus of risk in TBM is the credit risk.

Agenda of ALM / TBM Committee Meetings
The ALM department is responsible for the preparation and coordination of ALM reporting. Coordination of the market price forecast, coordination of proposals on ALM decisions. Preparation of standardised ALM reporting to be sent before the meeting (2−4 days) to the participants. ALM department will also prepare the TBM meetings and coordinate proposals on measures to decide on within the meetings.
The agenda of the meetings follows the decision making process of ALM and TBM. Starting point is an overview on risk (ICAAP) and limit utilisation.
Instruments: ALM instruments will be mentioned in the ALM and risk handbook. All instruments have to be fully introduced (Product introduction completed).
Limits: Total bank risk is allocated and limited by TBM. ALM decisions have to conform to TBM risk limits. The ALM-Committee decides on sub limits for the trading and the ALM department. ALM department's limits are used for actions between the ALM meetings.
Decision making: The ALM-Committee decides according to its decision rules minimum and maximum risk per risk category. The implementation measures – within their limits – are managed by the ALM department. TBM meeting decisions will be implemented by the business line concerned. Follow up and monitoring will be performed by the ALM committee.
Minutes: are prepared by the ALM department as the administrative body of both committees.

The Forward Curve: Basis of ALM Reporting and Decision Making

Forwards are future market prices. These market prices are derived from the funding costs of a risk position until the forward date. Because funding costs depend on the yield curve for future maturities, the yield curve defines the forward prices.

An intuitive example with interest rates:
What is the forward rate for a 1 year term in 4 years, for the following yield curve?

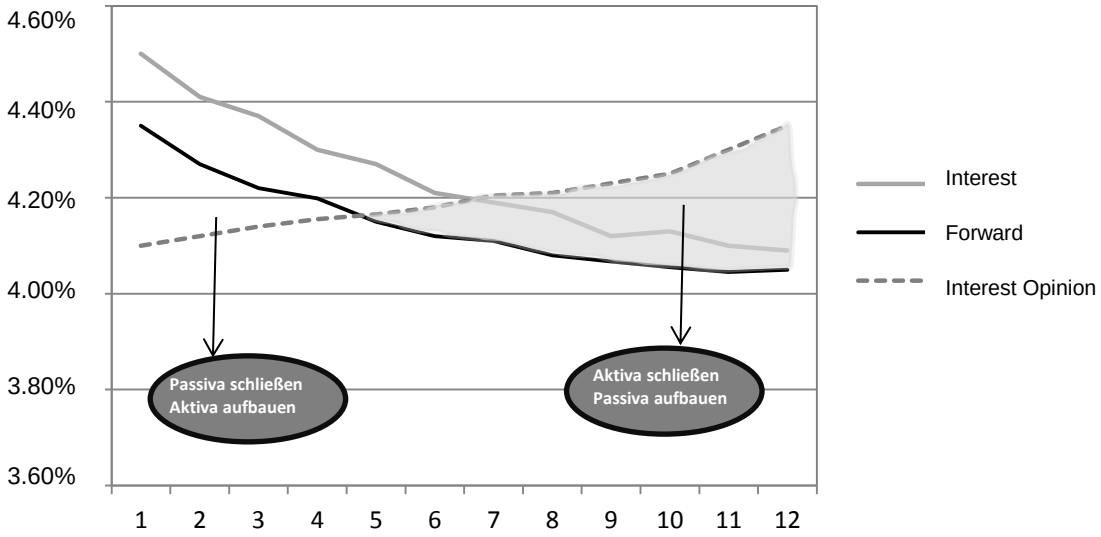
1 Yr	0.50%
4 Yrs	1.00%
5 Yrs	1.25%

Forward rate for 1 year term in 4 years: 2% (without compound interest)

Explanation: For 5 years funding and 4 years investment remains a 1 year's interest gap. Considering the interest difference over 4 years of 1.00% (4*0.25% = 1%), the interest rate of year 5 may be 2.00% to create an arbitrage free hedge position. So the fair forward price for the 1 year rate in 4 years will be 2.00%.

If forward prices are fair or arbitrage free they can be hedged at zero cost. Therefore entering into market risk positions does not make sense unless the market forecast in ALM has a market price opinion different from the forward rate.
Thus the following decision rules can be derived (example interest rates):

Forward Rate = market opinion	Do nothing
Forward Rate > market opinion	Increase assets; close liabilities
Forward Rate < market opinion	Reduce assets; increase liabilities



Agenda and Reporting of ALM meetings

Within the framework of ALM – under consideration of the market opinion for the managed risks – positioning for market risk is decided. The responsibility for profit or loss out of the market risk position of on and off balance sheet positions is up to the ALM-Committee.

The decisions in the ALM-Committee are defined as minimum/maximum risk positions for each market risk. Subsequently ALM will take market action execute the ALM's decisions. It will be allowed to act within limits for timing reasons and in order to react according to the committee's intentions between ALM-Committee meetings.

The proposed meeting agenda is highly transparent and allows the involvement of all ALM committee's members in the decision making process.

Steps	Agenda	Description
1	Review market opinion	Comparison of ALM´s market opinion during the last meeting with the market development since
2	Review results	Report and analysis of profit impact from the risk positions
3	Review risks	Report and analysis of all risk categories and limit usage
4	Market opinion	Specification of the bank´s market opinion regarding market prices until the next ALM meeting and yearend
5	Measures	Proposals for action and analysis of their impact on profit and risk.
6	Decisions	Decisions on risk positioning for each risk category (members of board)

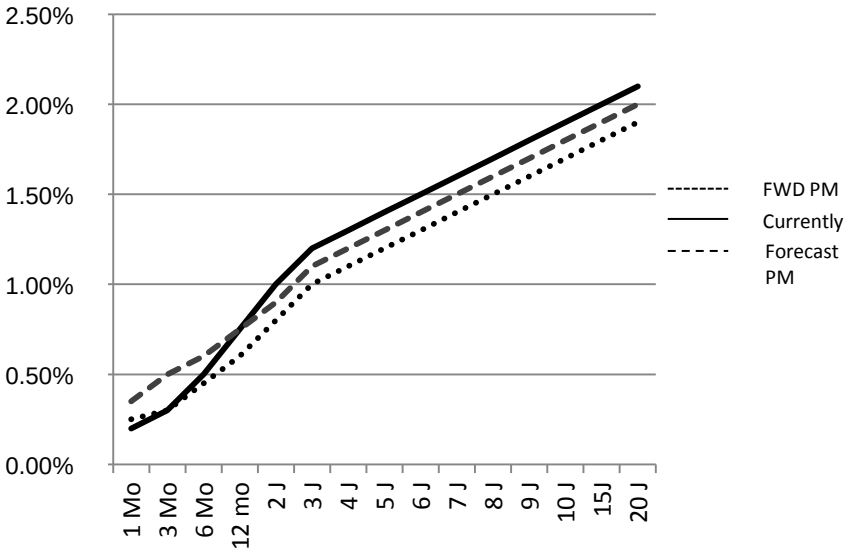
Separate reports and decision making for each risk category

Analysis und decision making follows one sequence for each risk category. Therefor reporting should also follow risk categories. The following model reporting gives an example for reporting and decision making on interest risk within the ALM committee.

ALM Reports – Example interest risk

Step 1: Review Market opinion

Principle: Compare forwards last month with the actual interests and the interest opinion from last ALM meeting



Comments Market:

- Expected increase of money market rates did not happen
- Interests rates longer than 12 months direction was correct but movement was underestimated

Step 2: Review Result of the Interest Risk

Principle: Accrual for all positions with average transfer price for each time bucket, MtM changes for all positions and impact on P&L

Report 2	**Total (in Mio.)**				
Terms	Gap(*)	MTM	Interest TP	Interests actual	Delta MtM
ON	-734.3	0.000	0.05%	0.05%	0.000
1 mo	526.8	-0.031	0.17%	0.10%	-0.007
3 mo	16.5	-0.005	0.28%	0.17%	-0.001
3-6 mo	42.4	-0.017	0.34%	0.26%	-0.004
6-12 mo	532.9	-0.530	0.63%	0.53%	-0.113
2 y	-425.9	3.280	1.10%	0.71%	0.696
3 y	-182.4	2.145	1.22%	0.82%	0.455
4 y	-120.8	1.785	1.31%	0.93%	0.379
5 y	163.1	-3.993	1.56%	1.05%	-0.848
8 y	-5.3	0.534	2.58%	1.20%	0.113
10 y	-3.6	0.752	3.70%	1.25%	0.160
10 – 15 y	-1.7	0.757	5.33%	1.40%	0.161
15 – 20 y	-1.7	1.079	6.07%	1.55%	0.229
> = 20 J	-1.6	1.178	6.22%	1.60%	0.250
Sum		6.079			1.290

Result	Day to month	Year to Date	Budget to Year
Accrual	0.588	3.588	2.000
Delta MtM	-0.483	1.200	1.000
Realised	0.000	0.000	
Total Return	0.105	4.788	3.000
Dv Delta MtM P&L	-0.600	-0.800	
Total P&L result	-0.012	2.788	

Comment market:

- Despite increase of interest rates the Gap contribution (Accrual) is positive due to high yield assets.
- Budget currently fulfilled

(*) Interest position bonds/funds in gaps considered

Step 3: Review Interest Risk and Limits

Report 3			**Limit PVBP**		
	PVBP*		from	to	Check Limit
To 3 Mo	-30		-20	-50	Ok
3 – 6 Mo	-70		-20	-50	Overdrawn
6 – 12 Mo	50		20	50	Ok
1 – 2 years	-60		-50	-80	Ok
2 – 3 years	-70		-50	-80	Ok
3 – 5 years	10		0	-30	Wrong side
5 – 10 years	-70		-50	-80	Overdrawn
> 10 years	-30		-20	-40	Ok

Comment from Risk dptmt.

Limit overdraft approved by board decision from DD.MM.YYYY

Explanation

Limit „from-to“ is the positioning range of ALM between the meetings of ALM-Committee

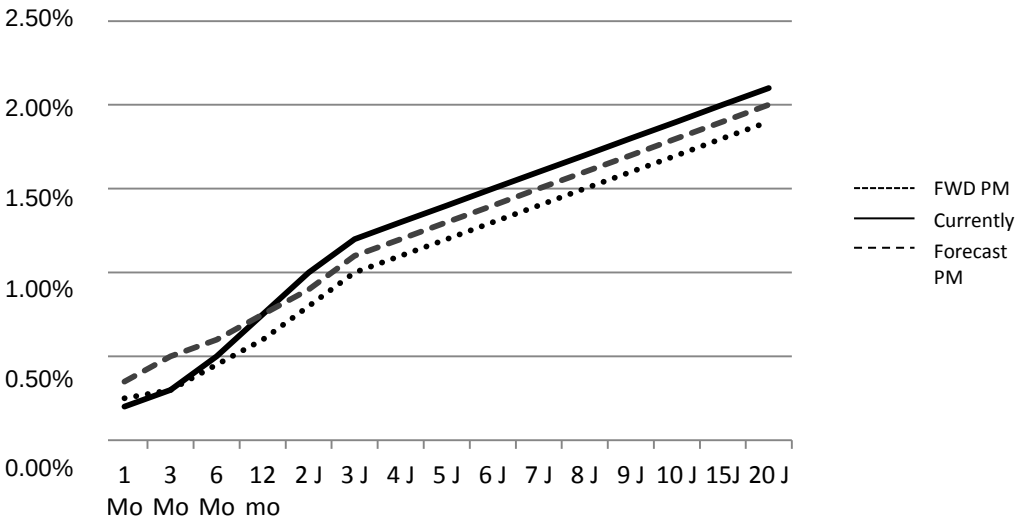
Total PVBP	-250	-200	-300	Ok

VaR 99%, 1Mo	7.500	10.000	Ok
200 BP Shirft in % of equity	50.000	70.000	Ok

Why is PVBP for positioning? PVBP includes the information on the duration of a position. It can easily be translated in position volumes. It can also be broken down from a total limit (which may be VaR as it is for ICAAP).

Step 4: Market Opinion for the next ALM

Principle: Compare forwards with the current opinion on interest rates



Comment ALM

- Increase money market rates and flat yield curve on money market expected
- Upside Parallel Shift long term

Additional Information
For decision making an additional year end market opinion is helpful

Step 5: Decisions

Principle: New limits and proposed measures under consideration of the given risk positions and market forecast

Report 5

		Limit PVBP		measures
	PVBP	By	to	changes
to 3 Mo	-30	20	30	+40
3 – 6 Mo	-70	10	20	+50
6 – 12 Mo	50	10	20	-10
1 – 2 years	-60	-40	-60	-40
2 – 3years	-70	-40	-60	-40
3 – 5 years	10	0	-20	Unchanged
5 – 10 years	-70	-40	-60	-30
> 10 years	-30	-20	-40	Unchanged
Total PVBP	-250	-150	-250	-50

VaR 99%, 1 Mo	7.500	10.000	Unchanged
200 BP Shift	50.000	70.000	Unchanged
In % of equity	15%		

ALM Proposals (example)

- Short term IB liabilities and Tender funding.
- Reduce asset positions in the capital market through interest risk hedging with interest swaps

Consequences on profits: pressure on gap contribution of about 0.200 mio. p.a.

Risk consequences: Reduction interest risk by about 2 mio. through reduction asset gaps

Parallel to the reporting of interest risk all other market risk may be reported and decisions taken in the ALM committee.

Interest Risk	Total bank position (incl. bonds in asset allocation)
Liquidity Cost Risk	Total bank position (incl. other assets/other liabilities and derivatives)
Credit Spread Risk	Bond portfolio and fungible assets
FX Risk	Total bank position
Share Risk	Total Asset Allocation

Focus on Liquidity Risk

While the liquidity cost risk is managed in the context with the market price risk, liquidity risk is a structural risk – its first and important impact is not so much on profitability but on illiquidity of the bank.

Liquidity risk management regulation was implemented with CRD II and makes now part of pillar 1 and 2 of the CRR liquidity management regime. Limits are primarily specified by the legislator. Internal limits refer on the security distance from legal limits to keep and on the quality of liquidity buffers to be held.

In the context of managing liquidity risk ALM-Committee will decide on:
Necessary overachievement of the ratios LCR and NSFR

- Time to Wall (period in which the bank in a stress situation needs no fresh money from outside without facing illiquidity)
- Encumbrance Ratio, the decision of how many assets should be used as collaterals for funding
- Collateral portfolio with quality specifications (ECB, General Collateral, Ratings) and time horizon for cash out of the portfolios holdings, even in periods of stress
- Liquidity buffer costs, calculated from actual funding prices (following the bank's methodology) and being charged as Transfer Prices

Liquidity risk reporting and management always refer to the total bank.

Example Report: Liquidity risk management:

	End of Year	**Last month**	**Actual**	**Minimum**	**Maximum**
LCR in %	120%	117%	118%	70%	130%
LCR Overhang/Shortfall abs	30	27	28		
NSFR in %	80%	78%	81%	70%	90%
NSFR coverage abs	-20	-22	-19		
Time2Wall stress	6 Mo	6 Mo	3 years	3 Mo	3 years

Limit – long term funding Gap in % of total assets	Ok	Ok	Ok		10%

Liquidity buffer costs	0.40%	0.35%	0.33%

Collateral portfolio	Market value actual	Changes last month	Market Value Stress	Realisation time in months
Level 1	100	5		1d93
Level 2A	30	-3		5d24
Level 2B	10	-2		105d

	Last month	Actual	Min	Max	measures
Encumbrance Ratio	5.1	5.0	3.5	5.5	

Other ECB elligible	15	-5	11	10 d
Other non ECB ellig.	25	-10	15	2 mo
Total	180	-15	26	

Example measures liquidity: Reduction of HLA buffers with x Mio and investment in according the current asset allocation. Additional profit50 BP % p.a.

measure 2: Long term funding in 5 years term with covered bonds, using a window of opportunity with maximum spread of 30 bp; target volume 250 mio., consequences on liquidity costs – x BP and consequences on the encumbrance ratio

1.7 Organisation of ALM/Total Bank Management (TBM)

Principal regulatory standards are structured in the same way as the chapters of this World: Business model – Transfer Pricing – Risk Measurement – Organisation. Comprehensive and additional regulatory standards will be included into the table after each part.

Business Model

The regulatory framework is an important factor that must be considered in the banking business models and in the implementation of the ALM. Basel II/CRD I set high demands on the total bank management with the ICAAP and SREP. Basel III/ CRR/CRD IV expands the requirements for the amount and quality of own funds and complements the three pillars of Basel II with the topics of liquidity and leverage. In the national implementation of the CRD IV the national bank laws on the duty of care of management and supervisory boards as well as the assessment of the business model have to be considered **(Articles 97 and 107 in conjunction with 76−87 CRD IV)**.

In the assessment of business models, the requirements on bank recovery and resolution are essential. The specific features of the recovery plan **(Article 5 BRRD) depend** on the size, complexity and interconnectedness of the institution or the financial group as well as the nature, scope, and complexity of the business model and the associated risks **(Directive 2014/59/EU of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms)**. The reorganization plan must include indicators that allow for early implementation of measures to restore the bank‘s financial stability to that extent that the institution can overcome a crisis on their own and without rescue measures by the public sector.

Under the **SREP (EBA Guidelines on common procedures and methodologies for the Supervisory Review and Evaluation Process [SREP],** EBA/GL/2014/13, 19.12.2014) the relevant regulatory authorities assess the regulations, policies, procedures and processes that an institution created to comply with the regulatory requirements, particularly risk measurement systems, the business model (business model analysis), the risks in stress tests, risk concentrations and the management of liquidity risks.

The **analysis of the business** model includes the analysis of the current business model, analysis of the strategy and financial plans, assessment of the business model viability,

assessing the sustainability of the strategy of the institution, risk analysis (identification of key vulnerabilities) and finally, the summary results, including scoring according to Title 4 of the EBA Guidelines the assessment of the business environment.

Under **Article 435 CRR** institutions must disclose their risk management objectives and risk management policies for each risk category with a risk declaration approved by the management and supervisory board in which the risk profile associated with the business strategy of the institute is represented with respect to its business model. This declaration includes key figures and information that provide outside researchers a comprehensive insight into the risk profile of the institution as well as an approved statement by the executive and supervisory board regarding the adequacy of the risk management procedures of the institution which shall grant that the established risk management systems are adequate in terms of the business model and risk profile of the institution.

The focus of the regulatory business model analysis (GMA) according to the SREP guidelines of EBA is on the assessment of the profitability of the current business model and the sustainability of the strategic plans of the institute. The supervisors assess in the context of the internal governance and institution-wide control systems the ICAAP and ILAAP, especially the institution’s ability to implement the risk strategies consistently with the risk appetite and the capital and liquidity plans. (EBA SREP guidelines, EBA/GL/2014/13, December 2014, page 11).

Capital and liquidity buffer requirements have to be met according to the forward-looking economic capital planning (ICAAP) and liquidity planning (ILAAP) of the SREP guidelines. In addition to the integration in the medium-term plan, possible regulatory capital requirements have to be taken into account in ensuring the risk-bearing capacity on a multi-year period.

Competent authorities carry out regular business model analysis to assess the plausibility of the business model as well as business and strategic risks and determine:

- the viability of the institution's current business model on the basis of its ability to generate acceptable returns over the following 12 months; and
- the sustainability of the institution's strategy on the basis of its **ability to generate acceptable returns over a forward-looking period of at least 3 years**, based on its strategic plans and financial forecasts (EBA SREP Guidelines, paragraph 55/58/ 59/76).

The plausibility and sustainability of the business model is assessed by the competent authorities in summary in 4 scores, whereat score (1) is, The business model and strategy pose no discernible risk to the viability of the institution, (2) a low level of risk (3) a medium level of risk, to score (4) The business model and strategy pose a high level of risk to the viability of the institution (EBA SREP Guidelines, paragraph 80).

In order to conduct the GMA competent authorities use at least the following sources of quantitative and qualitative information: strategic plan or -plans of the current year and forward-looking forecasts as well as the underlying economic assumptions; internal reporting (management information, capital planning, liquidity reporting, internal risk reports); recovery and resolution plans (EBA SREP Guidelines, paragraph 59).

It would be negligent if an institution would rely solely on the implemented quantitative methods despite the known limitations. Therefore, stress tests (scenario analysis) are an important complement to the going-concern- and liquidation-approach in the ICAAP. An institution must have in place sound stress testing procedures pursuant to **Article 177/290/368 CRR** to assess the adequacy of its capital base. It is therefore absolutely essential to additionally carry out stress tests by identifying the key risk drivers in the business model and consider possible adverse scenarios. This allows setting fast and targeted measures in times of crisis. The stress tests have to determine possible events or future changes in economic conditions which could have an adverse effect on the risk positions, whereat also the ability of the institute to withstand such changes shall be evaluated. Stress tests should test the robustness of the business model.

The report of the experts of Erkki Liikanen (**High-level Expert Group on reforming the structure of the EU banking sector**, Final Report, 02.10.2012) fuelled further discussion about business models of European banks. The model of the universal bank was criticised and a separation of proprietary trading and customer business required.

Continuative Regulations Business Model

Capital Requirement Directive – Capital adequacy of investment firms and credit institutions	Jun.06	EU Directives/Regulations
Capital Requirement Directive – Taking up and pursuit of the business of credit institutions	Jun.06	EU Directives/Regulations
Capital Requirement Directive – Banks affiliated to central institutions, certain own funds items, large exposures, supervisory arrangements, and crisis management	Sep.09	EU Directives/Regulations
Guidelines on stress testing (GL32)	Aug.10	EBA/CEBS Guidelines
Revisions to the Basel II market risk framework	Feb.11	BCBS Standards
Principles for financial market infrastructures	Apr.12	BIS Standards
Capital Requirement Directive – Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms	Jun.13	EU Directives/Regulations
Capital Requirement Regulation – Prudential requirements for credit institutions and investment firms	Jun.13	EU Directives/Regulations
Mortgage insurance: market structure, underwriting cycle and policy implications – final document	Aug.13	BIS Guidelines
Supervisory guidelines for identifying and dealing with weak banks – consultative report	Jun.14	BCBS Guidelines
Single Resolution Mechanism & Single Resolution Fund Regulation	Jul.14	EU Directives/Regulations
Corporate governance principles for banks – consultative document	Oct.14	BCBS Guidelines
Minimum requirement for own funds and eligible liabilities (MREL)	Nov.14	EBA/CEBS Guidelines
Guidelines on methods for calculating contributions to Deposit Guarantee Schemes (DGSs)	Nov.14	EBA/CEBS Guidelines
Guidelines on the treatment of shareholders in bail-in	Nov.14	EBA/CEBS Guidelines
Guidelines on methods for calculating contributions to Deposit Guarantee Schemes (DGSs)	Nov.14	EBA/CEBS Guidelines
Recommendation on dividend distribution policies	Jan.15	ECB Detaillierung
EBA issues final guidance on recovery	May.15	EBA/CEBS Guidelines

indicators (EBA-GL-2015-02)		
Guidelines on triggers for use of early intervention measures pursuant to Article 27(4) of Directive 2014/59/EU (EBA/GL/2015/03)	May.15	EBA/CEBS Guidelines
Guidelines on triggers for resolution (EBA/GL/2015/07)	May.15	EBA/CEBS Guidelines
Technical standards to ensure effective resolution under the BRRD (EBA/RTS/2015/05)	Jun.15	EU Implementing/Regulatory Technical Standards
Standards on processes for notifying that a banking institution is failing (EBA/RTS/2015/04)	Jul.15	EBA/CEBS Guidelines
Regulatory Technical Standards on independent valuers under Article 36(14) of Directive 2014/59/EU (EBA/RTS/2015/07)	Jul.15	EU Implementing/Regulatory Technical Standards
Guidelines on the application of simplified obligations under Article 4(5) of Directive 2014/59/EU (EBA/GL/2015/16)	Jul.15	EBA/CEBS Guidelines

Transfer prices

In general, the regulatory requirements for transfer prices – including model books, validation, use test – for interest rate, liquidity, credit spread have become more concrete in recent years.

In May 2015 the EBA published its final report regarding the minimum standards for interest rate risk management in the banking book ("**Guidelines on the management of interest rate risk arising from non-trading activities**") which includes essential requirements for the interest rate transfer price. The guidelines are to be understood as an update of the original guidelines ("Technical aspects of the management of interest rate risk arising from non-trading activities under the supervisory review process" of 3 October 2006) and have to be applied as of 01.01.2016.

Not least, the transfer price for the allocation of liquidity costs, -benefits and –risks has increasingly come to the fore of regulatory initiatives. The BIS published in this context in December 2011 the guideline "Liquidity transfer pricing: a guide to better practice".

Recommendation 2 in the technical consultations of CEBS on the liquidity management for the European Commission (**CEBS's technical advice to the European Commission on liquidity risk management, CEBS 2008)** states: "Institutions should have in place an adequate internal mechanism – supported where appropriate by a transfer pricing mechanism – which provides appropriate incentives regarding the contribution to liquidity risk of the different business activities. This mechanism should incorporate all costs of liquidity (from short to long-term, including contingent risk)."

Point 14 in Annex V of the additions to the CRD (Directive 2009/111/EC of the European Parliament and of the Council of 16 September 2009) states: "Robust strategies, policies, processes and systems shall exist for the identification, measurement, management and monitoring of liquidity risk over an appropriate set of time horizons, including intra-day, […]. Those strategies, policies, processes and systems shall be tailored to business lines, currencies and entities and shall include adequate allocation mechanisms of liquidity costs, benefits and risks."

Given these recommendations CEBS has drawn up guidelines on liquidity cost benefit allocation. In conjunction with the EBA guidelines on the supervisory review **(Guidelines on**

common procedures and methodologies for the supervisory review and evaluation process [SREP], December 2014), in particular the guidelines for internal governance, the presence of an effective transfer pricing mechanism is part of the dialog between supervisory authorities and institutions and significant for the assessment.

From the Basel 4 proposals on the capital requirement for market risk **(BCBS fundamental review of the trading book: outstanding issues, 12.2014; Fundamental review of the trading book: a revised market risk framework, 10.2013)** it can be deduced that the credit spread risk has to be measured separately. Thus, also the result credit spread has to be shown separately. This in turn requires that the bank has to install TP credit spreads (= credit spread at the time of completion).

Continuative Regulations Transfer Prices

Technical Advice to the European Commission on Liquidity Risk Management	Sep.08	EBA/CEBS Guidelines
Guidelines on liquidity cost benefit allocation	Oct.10	EBA/CEBS Guidelines
Guidelines on internal governance (GL 44), EBA 27.09.2011	Sep.11	EBA/CEBS Guidelines
Liquidity transfer pricing: a guide to better practice	Dec.11	BIS Guidelines
Capital Requirement Directive – Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms	Jun.13	EU Directives/Regulations
Capital Requirement Regulation – Prudential requirements for credit institutions and investment firms	Jun.13	EU Directives/Regulations
Fundamental review of the trading book: A revised market risk framework	Oct.13	BIS Guidelines
Guidelines on common procedures and methodologies for the supervisory review and evaluation process (SREP), EBA 19.12.2014	Dec.14	EBA/CEBS Guidelines
Fundamental review of the trading book: outstanding issues	Dec.14	BIS Guidelines
Guidelines on Technical aspects of the management of interest rate risk arising from non-trading activities in the context of the supervisory review process	May.15	EBA/CEBS Guidelines

Risk measurement

The following chapter highlights the risk measurement in banks with regard to its regulatory basis so that the interested reader can look up in the relevant regulations as required. It is divided on the one hand according to the risks credit, interest rate, liquidity, that is according to what risks are measured, and on the other hand according to pillar 1, pillar 2, that is where, in which pillar, the risks are measured, and concludes with the regulatory reporting requirements. It provides an overview of the regulations in chronological form. Details can be found in each world.

Pillar 1

Credit risk

With respect to credit risk (counterparty risk) the risk-weighted position amount is calculated by multiplying the exposure value by a risk weight. When using the **credit risk standardised approach (CRSA)** the institutions take as a basis for risk weighting the credit rating of an external rating agency that is recognised by the EBA. The EBA assigns the supervisory credit quality steps 1 to 6 to the categories used by the respective rating agency – for example, 1 for the category AAA or 6 for category C.

In addition, an institution must assign each position to one of the risk position classes that are specified in Article 112 REG (EU) 575/2013 (CRR). The combination of credit quality step and risk position class then leads to the CRSA risk weights (in %), for example, for companies in the credit quality step 1 20%, step 2 50%; institutions in step 1 20%, step 6 150%.

The principle is that depending on the exposure class and credit quality step different levels of risk weights have to be assigned. For example, if a bank grants a loan to a central government with credit quality step 1, this loan has to be weighted with 0%, thus there is no capital required.

Finally, there is a large part of exposure classes for which no external rating is available, because such a rating is not possible or necessary or would be associated with high costs. In these cases and in other unrated positions overall risk weights have to be used, for example,

for unrated companies 100%; for the retail business, for example, SMEs 75%; for exposures secured by real estate, for example, residential property loans completely secured by mortgages 35%, by commercial real estate 50% .

A more risk-sensitive determination of capital requirements can be achieved by applying the **IRB approach (Internal Ratings Based Approach).** This approach allows institutions to calculate the risk weights by using the institution's internal rating process. The risk weights are calculated via formulas depending on the asset class. For this purpose institutions must assign the individual risk positions under the IRB approach to one of the following asset classes:
Units or shares in CIUs **(Article 152 CRR)**

- Exposures to corporates, institutions and central governments and central banks (Article 153 CRR)
- Retail exposures (Article 154 CRR)
- Equity exposures (Article 155 CRR)
- Other non-credit-obligation assets (Article 156 CRR)
- Exposure amounts for dilution risk of purchased receivables (Article 157 CRR)

After assigning to one of the asset classes for each item the risk-weighted position value has to be determined, whereat the risk weight depends on several factors: Risk weight = f (probability of default (PD), loss given default (LGD); maturity (M)) If an institution uses statistical models in the process of credit assessment, according to Article 175 of the CRR it has to document its methodologies. This documentation includes Evidence of any circumstances under which the model does not work effectively.

- A rigorous statistical process including performance tests outside the observation period (out-of-time) and outside the sample (out-of-sample) to validate the model.
- A detailed description of the theory, assumptions and mathematical and empirical basis of the assignment of estimates to rating grades, individual obligors, exposures or risk pools, and the data source(s) that are used for the estimation of the model.
- If an institution has obtained a rating system or a model used within a rating system by a third party and if this seller has denied or restricted the institution's access to information on the methodology of the affected systems, models or basic data with reference to the protection of business secrets, the institution has to prove to the competent authority the adequacy of the risk model by itself.

Outlook Basel 4: In consultation are the following changes to the standard approaches of the Basel Committee (BCBS).

- Credit risk: review of the CR standardised approach, in all categories risk drivers per asset category are set. Target: reduction of reliance on external ratings. Risk weighting and factors retail financing: increase the requirements for preferred risk weights of 75%. Banks: are risk-weighted no longer based on an external credit rating of the bank or of the Member State, but based on a lookup table in the range of 30% to 300% based on two risk drivers: equity ratio (CET 1 ratio) and NPA ratio (non-performing assets, proportion of bad debts in the total volume). Corporates: are no longer risk-weighted on the basis of an external rating, but based on a lookup table in the range of 60% to 300% based on two risk drivers: profit and leverage; Moreover, alignment with the IRB approach. Residential real estate: deletion of the preferred weighting of 35% and replacing it with the LTV ratio and the debt service coverage ratio; Risk weighting according to lookup table in the range of 25% to 100%. Commercial mortgage: 2 options: treatment as unsecured loans with national option on a preferred weight or risk weight according LTV Ratio.

- Trading book: new standard approaches with updated volatility, amended credit risk, more accurate risk measurement, considering credit spread and basis risk; implementation 2016, consequence: sharp rise in the capital requirement (factor 3−5).

- Replacement risk: stricter approach, implementation by 01.2017.

Credit risk in case of OTC derivatives is determined by the replacement cost if the partner fails. The legislator indicates 3 different methods to measure risk and capital requirements for the replacement risk (Article 271−298 CRR).

- Maturity method (Original risk method): Credit equivalent over defined %-rate per year maturity from nominal volume (only for banking book positions).
- Current exposure method/CEM: Positive mark-to-market value + fixed add-on (depending on duration and asset class). This method is replaced by the SA-CCR (The Standard Approach for Measuring Counterparty Credit Risk Exposures) with the 1st of January, 2017.
- Internal models: Positive MtM value + add-on via VaR approach

The CVA (Credit Valuation Adjustment, implementation 1.1.2014) which was introduced by Basel 3/CRR falls into the credit risk measurement of OTC derivatives and refers to the risk that the positive replacement value decreases, because the credit risk premium for the counterparty increases. CVA must be calculated for all OTC derivatives (both for trading and banking book positions) (Article 381 CRR)**.** There are exceptions for OTC via CCP (Central Clearing Parties) and OTC as a hedge with corporates (Article 382 CRR). OTC derivatives with CCPs have to be risk weighted with 2% (Basel Committee).

CCP (Central Clearing Party): A company that is interconnected between buyers and sellers to serve as the contractor for each of the two. Receivables from counterparty credit risk with respect to all participants have to be sufficiently collateralised on a daily basis. The aim of CCP is that the default risk between the parties is minimised.

The EU Commission has decided on 6 August 2015 based on the proposal by ESMA in accordance with Article 4 EMIR (EU Regulation no. 648/2012 on OTC derivatives, central counterparties and trade repositories, also European Market Infrastructure Regulation) that the following 4 interest rate derivative contracts in euro, pound, sterling, yen and US dollar have to be settled through a CCP (EU Commission's decision, Commission Delegated Regulation [EU] supplementing Regulation [EU]No. 648/2012 of the European Parliament and of the Council by regulatory technical standards for the clearing obligation, cf. Annex of the Regulation).:

- IRS (with a term of 28 days and upward)
- Basis swaps (with a term of 28 days and upward)
- Forward-rate agreements (term 3d – 3y)
- OIS (term 7d – 3y)

The following table summarises the measurement of credit risk:

Credit Risk	Area of Application	Basel 3 / CRD IV requirements	Effect vis-á-vis Basel 2
Pillar 1	Standardised approach credit risk	According to risk weight table (analog Basel 2) Institutions (fnancials): rated always backed according to rating: non-rated according to country rating; no option	Higher capital requirement for financials
	IRB approach credit risk	PD calculation through the cycle (except sec./resec.)	Increase capital requirement depending on the methodology presently used
	Advanced IRB credit risk	PD calculation through the cycle LGD calculation down turn	Strong increase of regulatory capital requirement
	Replacement risk Derivatives	CVA requirement for derivatives CCP for defined OTC derivatives	Higher capital requirements and higher costs for the derivatives business
Pillar 2	ALL	All banks have to adjust the risk-bearing capacity in the stress case	Who did not have to calculate the stress case so far, has to start doing it in pillar 2

Capital Ratios for the Balance Sheet Structure

At the center of Basel III/CRR/CRD IV are strict **capital requirements** for banks.
There are on the one hand more stringent requirements on the **quality** of capital in accordance with **Article 25/26, 51/52, 62/63 CRR** and on the other hand on the **quantity** of capital in accordance with Article 92 CRR; **Article 128−140 CRD IV** in order to improve the stability of the financial system.

Accordingly, Common Equity Tier 1 (CET1) capital must make up at least 7% of total bank risks as of 01.01.2019 after the expiry of the transitional period. The CET1 ratio is composed of **4.5%** minimum rate and **2.5%** capital conservation buffer. The entire Tier 1 capital (Common Equity and Additional Tier 1 capital) must be at least **8.5%** and the total capital (Tier 1 plus Tier 2 capital) must be at least **10.5%.** The minimum rate for the regulatory

capital (total capital excluding capital conservation buffer) therefore remains as under Basel II at **8%.**

In addition, a countercyclical buffer is introduced which may vary dependent on the state of the economy **between 0% and 2.5%.** Tier III capital will no longer be counted. Also, systemic risk buffers and buffers for systemically important (large and worldwide/regionally active) institutions are introduced on a case-by-case basis dependent on the individual bank/situation/country.

Furthermore, the internal capital requirement under pillar 2 that is prescribed by the regulatory authority (regulatory base of the pillar 2 SREP ratio can be found in Articles 97 and 107 in conjunction with 76−87 CRD IV) has to be met. Thus, total capital requirements can add up to 20% and more, whereat CET1 capital which has the highest quality of all has the greatest importance and contributes the largest part. Moreover, the ECB has published a **recommendation on the restrictive dividend policy** on 28 January 2015. Accordingly, institutions are divided into 3 categories:

Category 1: institutes that already meet the minimum requirements set out in pillar 1 and 2, as well as all until 2019 to be met capital requirements (fully loaded):

- Conservative distribution of net profit

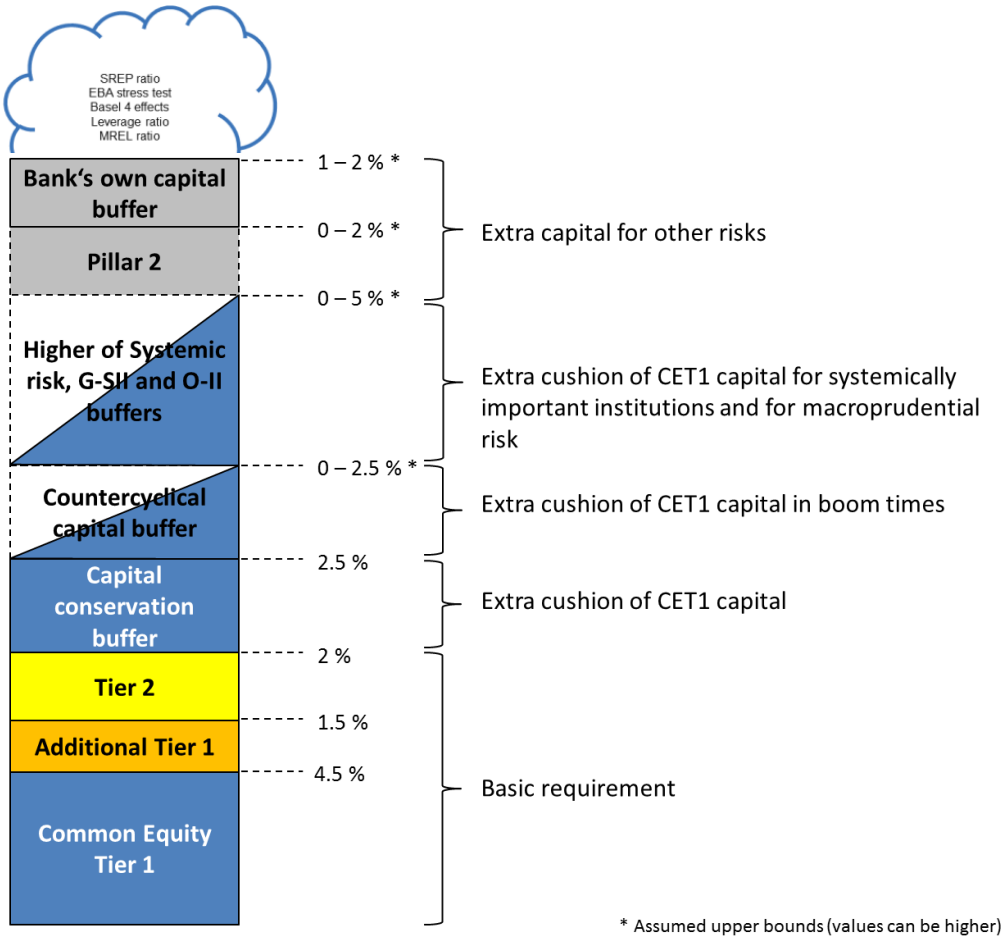
Category 2: institutes that meet pillar 1 and 2, but the full implementation of the 2019 requirements not yet

- Distribution only in so far as the 2019-requirements can be reached in a linear path (i.e. 25% of the gap must be closed each year)

Category 3: institutions that have according to the rules of the ECB stress tests (adverse scenario) per 31.12.2014 a capital shortfall or do not meet pillar 2 must not distribute anything.

The figure below summarises the regulatory capital requirements under **pillar 1 (minimum requirement) and pillar 2 (SREP/ICAAP)**:

Capital Fully Loaded



Source: European Commission 21.03.2013

Thus, by taking into account transitional provisions, depending on the systemic importance and risk appetite, a capital requirement of up to 22% (including ICAAP/internal buffer) is necessary.

If a credit institution wants to reduce its capital, it has to obtain the approval of the supervisory authority in advance **(Article 77/78 CRR).** However, the authority can for practical reasons (e.g. when capital instruments are sold out of the market to the institution;. when capital instruments are needed for employee compensation; Deminimis reduction measures, capital instruments are included in loan collaterals) give prior approval within limits (De-minimis interpretation: 1 − 3% per issue, market making: predefined amount that is to apply for, employee capital instruments: derived from the bonus rules; cf. Article 29 delegated Regulation). Organisational measures to avoid exceeding the reduction limits have to be taken.

To ensure the **quality of the regulatory capital** of institutions Basel 3/CRR/CRD IV provides strict requirements for the eligibility of capital instruments as regulatory capital. For this purpose, specific sets of criteria ensure the quality of capital categories or rather capital components.

These categories follow different purposes to which also the qualitative requirements are geared to. While the Tier 1 capital is to be used primarily to cover losses in accounting from ongoing operations (going concern case/continuation of business operations), the Tier 2 capital is intended to be taken as a liability mass in the event of insolvency of an institution (gone concern case).
Common Equity Tier 1 items consist of the following **(Article 25/26 CRR):**

- common shares issues by the bank that met the criteria of this category (or rather the criteria of non-joint stock companies)
- share premium accounts related to CET1 items
- retained earnings
- accumulated other comprehensive income
- common shares which were issued by consolidated subsidiaries und are hold by third parties (minority holding) and which meet the requirements for CET1
- so called “regulatory adjustments” that are applied in determining Common Equity Tier capital
- funds for general banking risk

The **Additional Tier 1** capital essentially comprises hybrid capital instruments, for example CoCos (contingent convertible bond, mandatory convertible notes) and consists of the sum of the following components **(Article 51/52 CRR):**

- instruments issued by the bank that meet the criteria for inclusion in the category “Additional Tier 1 capital” (and which are not part of CET1 capital)
- share premium accounts related to Additional Tier 1 capital
- instruments which were issued by consolidated subsidiaries and are hold by third parties and which meet the requirements for Additional Tier 1 capital and are not part of CET1
- regulatory adjustments that are applied in determining Additional Tier 1 capital The remaining **Tier 2 capital** consists of the following components **(Article 62/62 CRR):**
- instruments issued by the bank that meet the criteria for Tier 2 capital and which are not already part of Tier 1 capital

- share premium accounts related to Tier 2 capital
- instruments which were issued by consolidated subsidiaries and are hold by third parties and which meet the requirements for Tier 2 capital and are not part of Tier 1 capital
- regulatory adjustments that are applied in determining Tier 2 capital

The following figure summarises the basic characteristics of the three capital instruments:

Tier 1 Common Equity	Tier 1 Additional Capital	Tier 2 Capital
If the liquidation case, the subordinate claim	Subordinated to foreign capital and subordinated debt	Subordinate to foreign capital
Maturity: for an unlimited period	Maturity: for an unlimited period	minimum original maturity of five years, Linear amortisation by remaining maturities <5 years
There is no expectation that the instrument will be bought back, redeemed or cancelled nor do the statutory or contractual terms provide any feature which might give rise to such an expectation	May be callable at the initiative of the issuer • only after a minimum of five years prior supervisory approval • To create an expectation that the call will be exercised, is forbidden • Replacement issues by exercised Call is mandatory • No calls by capital adequacy problems • No funding/purchase from the bank or related party (in the broadest sense) General assembly decides about dividends	May be terminated at the initiative of the issuer • only after a minimum of five years • prior supervisory approval • No credit sensitive dividend feature • No calls by capital adequacy problems • No funding/purchase from the bank or related party (in the broadest sense)

In addition, Basel III and the European Regulation introduced **deductions** from regulatory capital (e.g. deferred taxes), thresholds for deductions, as well as a method for recognition of minorities **(Articles 36−49, 56−60 and 66−70 CRR).**

Leverage Ratio

In addition to the risk sensitive capital requirements in the area of pillar 1 (regulations of the minimum equity requirements), a leverage ratio is introduced under Basel 3/CRR as a key figure that is transparent and not risk based and demands a debt limit of maximum 3%. This risk independent maximum debt limit is defined as total debt quota measured as the ratio of the total eligible Tier 1 capital (Going Concern capital) to the total of both (not-weighted) on and off balance sheet assets.

The leverage ratio **(Article 429/430 CRR** calculation, **Article 430/499 CRR** regulatory reporting, **Article 451/521 CRR** disclosure) should restrict the excessive buildup of debts in the banking system and prevent on and off balance sheet growth in relation to equity (volume

risk). The leverage ratio determines a maximum debt ratio to avoid deleveraging processes that could harm the whole financial system.

Off balance sheet positions are generally valued with a credit conversion factor (CCF) of 100%. Hence, for credit lines the whole exposure has to be taken and regarded in the denominator of the ratio and not only the actually used value. For unconditional terminable commitments (e.g. financial lines) a CCF of 10% has to be applied.

Initially the leverage ratio is introduced as a pillar 2 key figure and assessed in the internal risk management framework of the supervisory review process. A step-bystep introduction is also applied here. From 2013 a test period joins a parallel running observation period during which the institutions are urged to publish their leverage ratio as from 2015.

For balance sheet items the total amount of gross exposures (without regard to value adjustment) have to be determined in coordination with financial account, whereas all assets, including high quality and liquid assets, have to be attributed to the total exposure.

$$Leverage\ Ratio = \frac{Going\ Concern\ Capital}{ON + OFF\ Balance\ Sheet\ Positions}$$

Liquidity Risk

The liquidity risk is limited under Basel III/CRR by two ratios (Liquidity Coverage Ratio, LCR and Net Stable Funding Ratio, NSFR). The first ratio – LCR – is to strengthen the short-term liquidity profile of a bank. The second ratio – NSFR – serves to strengthen the long-term liquidity profile. Both ratios must be above 100%.

- **Liquidity coverage ratio (LCR):** The ratio covers a period of 30 days. It sets the stock of highly liquid assets in relation to the net payment obligations in a stress scenario. This is to ensure that institutions have sufficient highly liquid assets to cope with a liquidity stress scenario that is defined by the regulator (Article 412 CRR). Thus, it should be assured that banks can handle considerable stress conditions to their disadvantage with regard to liquidity inflows and outflows during a period of 30 days without outside assistance. In periods of stress institutions may use their liquid assets to cover their net liquidity outflows. However, positions should not be counted twice as liquidity inflows and liquid assets. Minimum LCR 60% in 2015 to increase 10% per annum = 100% in 2019, but in CRR already 100% in 2018.

$$Liquidity\ Coverage\ Ratio = \frac{High\ liquid\ Assets}{Net\ Cash\ Outflows(under\ stress)} \geq 100\%$$

- **Structural liquidity ratio (Net Stable Funding Ratio, NSFR):** It is a longer-term funding ratio which refers to a time horizon of one year (Article 413 CRR "Stable Funding"). The ratio captures the total balance sheet items and should counteract an undue maturity mismatch between assets and liabilities. Law from 2018 onwards; start monitoring 01.01.2013.

$$NSFR = \frac{Stable\ Funding}{Required\ Stable\ Funding} > 100\%$$

Besides the creditors who demand more collateral for liquidity, the regulators tightened via the LCR the requirements toward covered funding and holding of a buffer for liquidity shortages at times of crisis.

Because one lesson of the financial crisis is that unsecured funding dries out quickly in times of stress. An unlimited use of assets for funding does, however, not lead to the desired goal, because with each assigned asset, the potential bankruptcy estate for the unsecured creditors (senior unsecured) is reduced. This form of funding will, none the less, always remain necessary, because a covered funding of 100% is not possible due to haircuts. The regulators have recognised the dangers of an excessively high assignment rate and introduced with the **Asset Encumbrance reporting** a tool which helps them to continuously monitor the appropriate ratios and to react early to unwanted developments. The BIS has staked out with the paper "**Asset encumbrance, financial reform and the demand for collateral assets**" (May 2013) the regulatory framework.

The following table lists significant regulatory standards of BIS/BCBS and EU/EBA/ ECB which are crucial for the liquidity risk management.

Liquidity Risk: Management and Supervisory Challenges	02.2008	BIS Guidelines
Guidelines on Liquidity Buffers & Survival Periods	12.2009	EBA/CEBS Guidelines
Guidelines on Liquidity Cost Benefit Allocation	12.2009	EBA/CEBS Guidelines
The use of derogations for currencies with insufficient liquid assets	10.2010	EBA/CEBS Guidelines
International framework for liquidity risk measurement, standards and monitoring	12.2010	BIS Guidelines
Additional collateral outflows on derivatives contracts	12.2011	EBA/CEBS Guidelines
Criteria for intragroup inflows and outflows	01.2013	EBA/CEBS Guidelines
Disclosures of unencumbered assets	04.2013	EBA/CEBS Guidelines
Asset encumbrance, financial reform and the demand for collateral assets	05.2013	BIS Guidelines
Reporting on unencumbered assets	06.2013	EBA/CEBS Guidelines
Currencies with insufficiency of liquid assets	06.2013	EBA/CEBS Guidelines
Additional liquidity monitoring metrics	06.2013	EBA/CEBS Guidelines
CRR Liquidity (Article 411 ff)	07.2013	EU Directives/Regulations
Guidelines on Supervisory Review an Evaluation Process (SREP) and Pillar 2	12.2013	EBA/CEBS Guidelines
Revised Pillar 3 disclosure requirements	01.2014	BIS Guidelines
Asset encumbrance	01.2014	BIS Guidelines
Guidance for Supervisors on Market-Based Indicators of Liquidity	01.2014	BIS Guidelines
Monitoring tools for intraday liquidity management	01.2014	BIS Guidelines
Basel III: The Net Stable Funding Ratio	01.2014	BIS Standards
Implementing Technical Standard for CRD IV & CRR - Annex XII Liquidity Coverage Ratio	06.2014	EU ITS/RTS
Implementing Technical Standard for CRD IV & CRR - Annex XII Liquidity Net Stable Funding Ratio	06.2014	EU ITS/RTS
Guidelines on harmonised definitions and templates for funding plans of credit institutions and ESRB/2012/2	06.2014	EBA/CEBS Guidelines
Implementing Technical Standards (ITS) on additional liquidity monitoring metrics (Delegated Regulation (EU) 2015/61)	10.2014	EU Implementing/Regulatory Technical Standards
Technical Standards (TS) on currencies with constraints on the availab. of liquid assets	10.2014	EBA/CEBS Guidelines
Guide to banking supervision	10.2014	Guidelines ECB
Net Stable Funding Ratio disclosure standards	01.2015	BIS Standards
The Liquidity Coverage Ratio and restricted-use committed liquidity facilities	01.2015	BIS Guidelines

Liquidity coverage ratio disclosure standards	01.2015	BIS Standards
Guidance for Supervisors on Market-Based Indicators of Liquidity	01.2015	BIS Guidelines

Pillar 2 (SREP)

The SREP (Supervisory Review and Evaluation Process) is conducted by the relevant supervisory authorities. It is the comprehensive process of the supervisory authority in the supervision and evaluation of risk management (risk measurement, organisation and processes) of the credit institution and the adequacy of its **ICAAP.** In addition, it contains the assessment of the compliance of all relevant rules, the identification of non-compliant circumstances as well as the imposition of supervisory measures. Furthermore, the supervisory authority is responsible for supervising the adequacy of the institution's procedures for liquidity buffers **(ILAAP).**

Liquidity risks

In case of risk measurement liquidity in pillar 2 it has to be distinguished between the liquidity cost risk (risk of rising liquidity- or rather funding costs) and liquidity risk (risk of illiquidity).

Liquidity cost risk

Due to the risk that the liquidity costs (funding costs) increase also the liquidity is part of the **ICAAP (EBA Guidelines on common procedures and methodologies for the Supervisory Review and Evaluation Process (SREP) (EBA/GL/2014/13, 19.12.2014).** Under the ICAAP the liquidity cost risk of a stress situation must be covered with risk-bearing capacity.

According to SREP guidelines (Title 8. Assessing risks to liquidity and funding, Title 9. SREP liquidity assessment) the increase in funding costs has to be measured under stress. The capital commitments are WITHOUT stress. It has to be measured the impact of increased funding costs in the case of stress on the open position (without stress).

Liquidity risk/pillar 2

On 24 July 2014 the EBA published the revised final ITS "**Implementing Technical Standards on additional liquidity monitoring metrics under Article 415 (3) (b) of Regulation (EU) No 575/2013**" (EBA/ITS/2013/11/rev1) which constitute the regulatory basis for the measurement of liquidity risk in ILAAP (Internal Liquidity Adequacy Assessment Processes).

The standard provides requirements, in addition to those contained in the Pillar 1 (standardised) liquidity ratios LCR/NSFR, for the risk assessment of liquidity risk (**risk of illiquidity**) under the SREP respectively ILAAP, which is next to the ICAAP part of the SREP.

Moreover, as part of the strategic liquidity management, the regulatory requirements for **contingency funding plans** have to be met (EBA Guidelines on harmonised definitions and templates for funding plans of credit institutions and Recommendation A4 of ESRB/2012/2, EBA/GL/2014/04, 19.6.2014). Here, the structure of funding sources is steered in a way that the supply of liquidity remains guaranteed even in crisis situations.

Credit spread risk

The focus of the regulatory amendments from the financial market crisis in 2008 were mainly risk types such as liquidity and concentration risks as well as overall control approaches, such as the expanded requirements on the business strategy and stress tests and the risk inventory and the capital planning process. New requirements for market risk were only available in some areas, for example in the binding integration of credit spread risks in the ICAAP.

In addition to the usual market price risks, in particular interest rate risks, credit spread risks have to be integrated in the ICAAP and risk management as well. During the financial crises a pronounced volatility of credit spreads was observed that was hardly noticed before. This has already been taken into account in 2010 in the minimum requirements for risk management. With the **EBA Guidelines on common procedures and methodologies for the Supervisory Review and Evaluation Process (SREP)** (EBA/GL/2014/13, 19.12.2014) the capture of credit spread risks in the ICAAP has been prescribed in binding form in principle for all institutions (Title 6.3 Assessment of market risk).

Interest rate risk

In pillar 2 the focus lies on the interest rate risk in the banking book, also in case of institutions with simple business models that are often exposed to high interest rate risk. The Basel interest rate shock of 200 basis points was only a first indication here.

On 22 May 2015 the EBA published its final report regarding the minimum standards for interest rate risk management in the banking book (**"**Guidelines on the management of interest rate risk arising from non-trading activities**"**). The guidelines are to be understood as an update of the original guidelines ("Technical aspects of the management of interest rate risk arising from non-trading activities under the supervisory review process" of 3 October 2006) and relate to the pillar 2 Article 98(5) of CRR 2013/36/EU – for which the term IRRBB is usually used ("Interest Rate Risk in the Banking Book"). The start of the binding application is according to EBA on 1.1.2016.

With it the regulator wants to increasingly set the interest rate risk in dependence on the available risk coverage volume.

From compliance perspective, the EBA emphasises the special responsibility of the management board in the "**Guidelines on Internal Governance**" of September 2011:

- To understand the functioning of the interest rate risk measurement used
- To understand the strengths/weaknesses of the methods used
- To understand the complexity of the derivatives used
- To have the ability and adequate knowledge how to cooperate in this issue with the supervisory authority in the ICAAP-SREP dialogue (fit and proper requirement)

Regulatory reporting

An institution has to submit (usually quarterly) information about its financial situation (financial information), to the relevant supervisory authority regularly. Once a year information on the risk-bearing capacity has to be submitted as well. Those who do not ensure that an institution has adequate policies, processes, functions and concepts available (negligence), have to expect administrative sanctions, in the form of a “natural person monetary fine” (Article 66−72 CRR).

The review of compliance of the quantitative requirements is made by the submission of the data to the competent supervisory authorities. The first consolidated reporting of COREP, on large exposures, losses on real estate collateral, the leverage ratio, LCR, NSFR was on 31.3.2014, the reporting of FINREP on 30.9.2014. COREP and FINREP implement a substantial part the concept to modernise the regulatory reporting system of the centralised banking supervision in the EU banking union. FINREP stands for Financial Reporting and refers to the **Annexes II and IV of the EBA guidelines on regulatory reporting requirements for credit institutions** which serve for the harmonisation of requirements for consolidated financial IFRS reporting.

COREP stands for Common Reporting and aims to harmonise the requirements for consolidated capital reporting (**Annex I EBA guideline**). COREP and FINREP will be further developed in the Implementing Technical Standards (ITS) of the EBA, whereat the ITS as implementing technical standards are directly applicable law in the Member States (cf. Article 15 EBA regulation and Regulation [EU] no. 1093/ 2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority).

Required regulatory reports for credit institutions in accordance with CRD IV & CRR (ITS/Implementing Technical Standards):

- Annex I Solvency reporting on own funds (“COREP”)
- Annex III Financial information for IFRS banks (“FINREP”)
- Annex IV Financial information for national GAAP banks (“FINREP”)
- Annex VI Real estate losses
- Annex VIII Large Exposures
- Annex X Leverage Ratio
- Annex XII Liquidity Coverage Ratio
- Annex XII Liquidity Net Stable Funding Ratio

With the new harmonised reporting requirements the regulator receives detailed infra- annual information on the earnings and risk situation as well as the P&L budget figures in order to detect imbalances early and can intervene promptly with countermeasures that are based on the CRD IV implementation. With the information on the earnings and risk situation in both the ALM and customer business which should correspond in their quality with the reports to senior management, the supervision has the opportunity to seek talks at an early stage on an informed basis with the management and the key functions especially in ALM to search for the development of the bank and to evaluate their personal suitability in control competences.

Continuative regulations risk measurement

International Convergence of Capital Measurement and Capital Standards	Jun.04	BCBS Standards
Capital Requirement Directive - Capital adequacy of investment firms and credit institutions	Jun.06	EU Directives/Regulations
Guidelines on liquidity buffers and survival period	Dec.09	EBA/CEBS Guidelines
Capital Requirement Directive - Capital requirements for the trading book and for re-securitisations, and the supervisory review of remuneration policies	Jan.10	EU Directives/Regulations
Implementation Guidelines for instruments acc. Article 57 (a) [own funds] Directive 2006/48/EC	Jun.10	EBA/CEBS Guidelines
Additional liquidity monitoring metrics	Aug.10	EU Implementing/Regulatory Technical Standards
Guidelines on stress testing (GL32)	Aug.10	EBA/CEBS Guidelines
Guidelines on the management on concentration risk under the supervisory review process (GL31)	Sep.10	EBA/CEBS Guidelines
Guidelines on Article 122a of the Capital Requirements Directive	Dec.10	EBA/CEBS Guidelines
Benchmarking Exercise	Feb.11	EU Implementing/Regulatory Technical Standards
Revisions to the Basel II market risk framework	Feb.11	BCBS Standards
Mapping of external credit assessments for securitisation exposures	Jun.11	EU Implementing/Regulatory Technical Standards
Basel III: A global regulatory framework for more resilient banks and banking systems	Jun.11	BCBS Standards

Principles for the Sound Management of Operational Risk	Jun.11	BCBS Guidelines
Guideline on the Incremental Default and Migration Risk Charge (IRC)	May.12	EBA/CEBS Guidelines
Main Indices in Recognised Exchanges	Jul.12	EU Implementing/Regulatory Technical Standards
European Market Infrastructure Regulation	Jul.12	EU Directives/Regulations
Functioning of colleges	Jan.13	EU Implementing/Regulatory Technical Standards
International framework for liquidity risk measurement, standards and monitoring	Jan.13	BCBS Standards
Principles for effective risk data aggregation and risk reporting	Jan.13	BCBS Guidelines
Asset encumbrance	Mar.13	BIS Guidelines
Asset encumbrance, financial reform and the demand for collateral assets	May.13	BIS Guidelines
Capital Requirement Directive - Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms	Jun.13	EU Directives/Regulations
Capital Requirement Regulation - Prudential requirements for credit institutions and investment firms	Jun.13	EU Directives/Regulations
Guidelines on Technical aspects of the management of interest rate risk arising from non trading activities in the context of the supervisory review process	Jun.13	EBA/CEBS Guidelines
The non-internal model method for capitalising counterparty credit risk exposures - consultative document	Jun.13	BCBS Guidelines
Frequently asked questions on Large Exposures QIS	Jun.13	BCBS Guidelines
Recommendation on the preservation of core Tier 1 capital during the transition to the Capital Requirements Directive/Capital Requirements Regulation framework	Jul.13	EBA/CEBS Recommendation
Implementing Technical Standards (ITS) on Disclosure for Own Funds	Jul.13	EBA/CEBS Recommendation
Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement	Jul.13	BCBS Guidelines
Mortgage insurance: market structure, underwriting cycle and policy implications	Aug.13	BCBS Standards

Regulatory Technical Standards (RTS) on close correspondence between the value of an institution's covered bonds and the value of the institution's assets relating to the institution's own credit risk	Sep.13	EBA/CEBS Recommendation
Fundamental review of the trading book: A revised market risk framework	Oct.13	BCBS Standards
Recommendation on asset quality reviews	Oct.13	EBA/CEBS Recommendation
Directive 2004/10/EC on transparency	Nov.13	EU Directives/Regulations
Specification of the calculation of specific and general credit risk adjustments	Dec.13	EU Implementing/Regulatory Technical Standards
Own Funds disclosure	Dec.13	EU Implementing/Regulatory Technical Standards
Disclosure template for leverage ratio	Dec.13	EU Implementing/Regulatory Technical Standards
Guidelines on Supervisory Review an Evaluation Process (SREP) and Pillar 2	Dec.13	EBA/CEBS Guidelines
Guideline on capital measures for foreign currency lending to unhedged borrowers under the supervisory review and evaluation process (SREP)	Dec.13	EBA/CEBS Guidelines
Regulatory Technical Standards on the determination of the overall exposure to a client or a group of connected clients in respect of transactions with underlying assets	Dec.13	EBA/CEBS Recommendation
Implementing Technical Standards on the Hypothetical Capital of a Central Counterparty (CCP)	Dec.13	EBA/CEBS Recommendation
Regulatory Technical Standards (RTS) on the definition of materiality thresholds for specific risk in the trading book	Dec.13	EBA/CEBS Recommendation
Implementing Technical Standards (ITS) on appropriately diversified indices	Dec.13	EBA/CEBS Recommendation
Regulatory Technical Standards (RTS) on securitisation retention rules and Draft Implementing Technical Standards (ITS) to clarify the measures to be taken in the case of non-compliance with such obligations	Dec.13	EBA/CEBS Recommendation
Guidelines on capital measures for foreign currency lending	Dec.13	EBA/CEBS Guidelines
Own Funds (Part 1, 2 and Gain on Sale)	Jan.14	EU Implementing Regulatory Technical Standards
Financial conglomerates	Jan.14	EU Implementing/Regulatory Technical Standards
Eligible collateral within CRM framework	Jan.14	EU Implementing/Regulatory

		Technical Standards
A Sound Capital Planning Process: Fundamental Elements	Jan.14	BCBS Guidelines
Guidance for Supervisors on Market-Based Indicators of Liquidity	Jan.14	BCBS Guidelines
Securities Financing Transactions	Jan.14	BIS Guidelines
Regulation on reporting and transparency of securities financing transactions	Jan.14	EU Implementing/Regulatory Technical Standards
Revised good practice principles for supervisory colleges - consultative document	Jan.14	BCBS Guidelines
Note on the comprehensive assessment: asset quality review and stress test parameter	Feb.14	ECB Guidelines
Materiality of model changes and extensions (credit and operational risk)	Mar.14	EU Implementing/Regulatory Technical Standards
Risks in activities of options and warrants	Mar.14	EU Implementing/Regulatory Technical Standards
Definition of materiality thresholds for specific risk	Mar.14	EU Implementing/Regulatory Technical Standards
Securitisation retention requirement	Mar.14	EU Implementing/Regulatory Technical Standards
Conditions for conditional guarantees	Mar.14	EU Implementing/Regulatory Technical Standards
Immaterial portfolios	Mar.14	EU Implementing/Regulatory Technical Standards
Disclosures of unencumbered asset	Mar.14	EU Implementing/Regulatory Technical Standards
Mapping of external credit assessments for exposures	Mar.14	EU Implementing/Regulatory Technical Standards
External audits of banks	Mar.14	BCBS Standards
Asset quality review_Phase 2	Mar.14	ECB Guidelines
Technical Standards (TS) on currencies with constraints on the availability of liquid assets	Mar.14	EBA/CEBS Recommendation
Regulatory Technical Standards (RTS) on Own Funds	Mar.14	EBA/CEBS Recommendation
External audits of banks - final document	Mar.14	BCBS Guidelines
Supervisory framework for measuring and controlling large exposures	Apr.14	BCBS Guidelines
Capital requirements for bank exposures to central counterparties	Apr.14	BCBS Guidelines
The standardised approach for measuring counterparty credit risk exposures	Apr.14	BIS Guidelines
Methodological note EU-wide Stress Test 2014	Apr.14	EBA/CEBS Recommendation
Implementation Technical Standards (ITS) for CRD IV & CRR - Annex I Solvency reporting	Apr.14	EBA/CEBS Recommendation

on own funds (“COREP”)		
ITS for CRD IV & CRR - Annex III Financial information for IFRS banks (“FINREP”)	Apr.14	EBA/CEBS Recommendation
ITS for CRD IV & CRR - Annex IV Financial information for national GAAP banks (“FINREP”; NB at Supervisory discretion)	Apr.14	EBA/CEBS Recommendation
ITS for CRD IV & CRR - Annex VI Real estate losses	Apr.14	EBA/CEBS Recommendation
ITS for CRD IV & CRR - Annex VIII Large Exposures	Apr.14	EBA/CEBS Recommendation
ITS for CRD IV & CRR - Annex X Leverage Ratio	Apr.14	EBA/CEBS Recommendation
ITS for CRD IV & CRR - Annex XII Liquidity Coverage Ratio	Apr.14	EBA/CEBS Recommendation
ITS for CRD IV & CRR - Annex XII Liquidity Net Stable Funding Ratio	Apr.14	EBA/CEBS Recommendation
Regulatory Technical Standards in relation to credit valuation adjustment risk	Apr.14	EBA/CEBS Recommendation
Regulatory Technical Standards (RTS) on risk mitigation techniques for OTC derivatives not cleared by a central counterparty (CCP)	Apr.14	EBA/CEBS Recommendation
Regulatory Technical Standards in relation to credit valuation adjustment risk	Apr.14	EBA/CEBS Recommendation
Frequently Asked Questions on Basel III's January 2013 Liquidity Coverage Ratio	Apr.14	BCBS Guidelines
Assessment methodologies for the Advanced Measurement Approaches for operational risk	May.14	EU Implementing/Regulatory Technical Standards
Reporting of Hypothetical Capital of a CCP	May.14	EU Implementing/Regulatory Technical Standards
Joint decision on approval of internal models	May.14	EU Implementing/Regulatory Technical Standards
Bank Recovery and Resolution Directive	May.14	EU Directives/Regulations
Geographical location of a relevant credit exposure	Jun.14	EU Implementing/Regulatory Technical Standards
Own Funds Part 3	Jun.14	EU Implementing/Regulatory Technical Standards
The use of derogations for currencies with insufficient liquid assets	Jun.14	EU Implementing/Regulatory Technical Standards
Additional collateral outflows on derivatives contracts	Jun.14	EU Implementing/Regulatory Technical Standards
Own Funds Part 4	Jun.14	EU Implementing/Regulatory Technical Standards
Prudent valuation adjustments	Jun.14	EU Implementing/Regulatory Technical Standards
Definition of default - Thresholds for past due items	Jun.14	EU Implementing/Regulatory Technical Standards
Criteria for intragroup inflows and outflows	Jun.14	EU Implementing/Regulatory

		Technical Standards
Own downturn LGD	Jun.14	EU Implementing/Regulatory Technical Standards
Risk weights for mortgage lending	Jun.14	EU Implementing/Regulatory Technical Standards
Supervisory reporting	Jun.14	EU Implementing/Regulatory Technical Standards
Information Exchange	Jun.14	EU Implementing/Regulatory Technical Standards
Supervisory practices relating to the securitisation retention rules	Jun.14	EU Implementing/Regulatory Technical Standards
Supervisory disclosure	Jun.14	EU Implementing/Regulatory Technical Standards
Joint decisions	Jun.14	EU Implementing/Regulatory Technical Standards
Currencies with narrow CB eligibility	Jun.14	EU Implementing/Regulatory Technical Standards
Guidelines on disclosure of encumbered and unencumbered assets	Jun.14	EBA/CEBS Guidelines
Regulatory technical standards on the permanent and temporary use of IRB approach	Jun.14	EBA/CEBS Recommendation
Implementing Technical Standards (ITS) on disclosure for leverage ratio	Jun.14	EBA/CEBS Recommendation
Guidelines on harmonised definitions and templates for funding plans of credit institutions	Jun.14	EBA/CEBS Guidelines
Regulatory Technical Standards on assessment methodologies for the use of AMAs for operational risk	Jun.14	EBA/CEBS Recommendation
Technical standards and guidelines for the identification of global systemically important institutions (G-SIIs)	Jun.14	EBA/CEBS Recommendation
Principles for effective supervisory colleges	Jun.14	BCBS Guidelines
Materiality of model extensions and changes (market risk)	Jul.14	EU Implementing/Regulatory Technical Standards
Permanent partial use of SA	Jul.14	EU Implementing/Regulatory Technical Standards
Countercyclical buffer disclosures	Jul.14	EU Implementing/Regulatory Technical Standards
Guidelines for common procedures and methodologies for the supervisory review and evaluation process (SREP)	Jul.14	EBA/CEBS Guidelines
Implementing Technical Standards on Supervisory Reporting	Jul.14	EBA/CEBS Recommendation
Implementing Technical Standards (ITS) on	Jul.14	EBA/CEBS Recommendation

additional liquidity monitoring metrics		
Regulatory Technical Standards for the specification of margin periods of risk for the treatment of clearing members' exposures to clients	Jul.14	EBA/CEBS Recommendation
Regulatory Technical Standards (RTS) on the conditions for assessing the materiality of extensions and changes of internal approaches for credit, market and operational risk	Jul.14	EBA/CEBS Recommendation
Guidelines on significant risk transfer (SRT) for securitisation transactions	Jul.14	EBA/CEBS Guidelines
Implementing Technical Standards Amending Commission Implementing Regulation (EU) No 680/2014 on Supervisory Reporting of institutions	Jul.14	EBA/CEBS Recommendation
Implementing Technical Standard (ITS) on Supervisory Reporting (Forbearance and non-performing exposures)	Jul.14	EBA/CEBS Recommendation
Grandfathering of SA approach for equity exposures	Aug.14	EU Implementing/Regulatory Technical Standards
PD estimation (data waiver)	Aug.14	EU Implementing/Regulatory Technical Standards
Data Point Model and Taxonomies for Implementing Technical Standard (ITS) on Supervisory Reporting	Aug.14	EBA/CEBS Recommendation
Risk weights for specialised lending exposures	Sep.14	EU Implementing/Regulatory Technical Standards
Mortgage Lending Value	Sep.14	EU Implementing/Regulatory Technical Standards
Diversified indices	Sep.14	EU Implementing/Regulatory Technical Standards
Disclosing the values of indicators by G-SIIs	Sep.14	EU Implementing/Regulatory Technical Standards
Guidelines on the revised large exposures regime	Sep.14	EBA/CEBS Guidelines
The list of significant supervised entities and the list of less significant institutions	Sep.14	ECB Guidelines
Opinion of the European Central Bank on the implementation of the European Bank Recovery and Resolution Directive (CON/2014/67)	Sep.14	ECB Guidelines
Transactions with exposures to underlying assets	Oct.14	EU Implementing/Regulatory Technical Standards
Identification of G-SIIs	Oct.14	EU Implementing/Regulatory Technical Standards
Implementation Guidelines on large	Oct.14	EBA/CEBS Guidelines

exposures exemptions for money transmission, correspondent banking, clearing and settlement and custody services		
Guidelines on the management of operational risk in market-related activities	Oct.14	EBA/CEBS Guidelines
Frequently asked questions on the Basel III leverage ratio framework	Oct.14	BCBS Guidelines
Review of the Principles for the Sound Management of Operational Risk	Oct.14	BCBS Guidelines
Aggregate Report on the comprehensive assessment	Oct.14	ECB Guidelines
Regulatory Technical Standards on assessment methodology for IRB approach	Nov.14	EBA/CEBS Recommendation
Guide to banking supervision	Nov.14	ECB Guidelines
Margin Periods Of Risk	Dec.14	EU Implementing/Regulatory Technical Standards
Closely correlated currencies	Dec.14	EU Implementing/Regulatory Technical Standards
Guidelines on materiality, proprietary and confidentiality and on disclosure frequency	Dec.14	EBA/CEBS Guidelines
Revisions to the securitisation framework	Dec.14	BCBS Standards
Revisions to the Standardised Approach for credit risk	Dec.14	BCBS Standards
Capital floors: the design of a framework based on standardised approaches	Dec.14	BCBS Standards
Revisions to the standardised approach for credit risk - consultative document	Dec.14	BCBS Standards
Capital floors: the design of a framework based on standardised approaches - consultative document	Dec.14	BCBS Standards
Fundamental review of the trading book: outstanding issues - consultative document	Dec.14	BCBS Standards
Revisions to the securitisation framework	Dec.14	BCBS Standards
Regulatory technical standards on disclosure of information related to the countercyclical capital buffer	Dec.14	EBA/CEBS Recommendation
Regulatory Technical Standards (RTS) on capital requirements for Central Counterparties (CCPs)	Dec.14	EBA/CEBS Recommendation
Guidelines on AMA extensions and changes	Dec.14	EBA/CEBS Guidelines
Regulatory technical standards on disclosure of information related to the countercyclical capital buffer	Dec.14	EBA/CEBS Recommendation
PD estimation	Jan.15	EU Implementing/Regulatory Technical Standards
Reporting on unencumbered assets	Jan.15	EU Implementing/Regulatory

		Technical Standards
Revised Pillar 3 disclosure requirements	Jan.15	BCBS Standards
Regulatory Technical Standards on valuation	Jan.15	EBA/CEBS Recommendation
CVA risk Own Funds Requirements	Feb.15	EU Implementing/Regulatory Technical Standards
Forbearance and technical Amendments to Supervisory Reporting	Feb.15	EU Implementing/Regulatory Technical Standards
Guidance on accounting for expected credit losses - consultative document	Feb.15	BCBS Guidelines
Developments in credit risk management across sectors: current practices and recommendations - consultative document	Feb.15	BIS Guidelines
Recommendations on securitisation (JC 2015 022)	May.15	EBA/CEBS Recommendation
(Guidelines on interest rate risk arising from non-trading activities	May.15	EBA/CEBS Guidelines
Margin requirements for non centrally cleared derivatives under Article 11(15) of Regulation (EU) No 648/2012 (JC/CP/2015/002)	Jun.15	EBA/CEBS Guidelines
Amended technical standards on leverage ratio disclosure and reporting (EBA/ITS/2015/03)	Jun.15	EU Implementing/Regulatory Technical Standards
Amended technical standards on reporting of liquidity coverage ratio (EBA-ITS-2015-04)	Jun.15	EU Implementing/Regulatory Technical Standards
RTS on procedures for excluding 3rd country non-financial counterparties (NFC) from CVA risk charge (EBA/CP/2015/14)	Aug.15	EU Implementing/Regulatory Technical Standards
Guidelines on the application of the definition of default under Article 178 of Regulation (EU) 575/2013 (EBA/CP/2015/15)	Sep.15	EBA/CEBS Guidelines

Governance: Organisational principles, incompatibility of activities, organisational structure, committees, front-/back-office

A bank has to set rules for structure and workflow organisation regarding the nature, scale, complexity and risk of its business activities. These are also including risk management and risk controlling processes (internal control system) **(Article 76−96 CRD IV in conjunction with EBA guidelines on internal governance [GL 44], 27.09.2011).**

General requirements of risk management and overall management responsibility: In order to achieve these objectives all executives are responsible for the implementation, regardless of their internal function. This responsibility cannot be delegated **(article 88 CRD IV).**

A fundamental principle of the organisational structure is that incompatible activities have to be carried out by different staff (Article 88 CRD IV). As a general rule business activities must be operated on the basis of (written) organisational guidelines (for example manuals). The organisational guidelines must include arrangements for the structure and workflow organisation as well as task allocation, competencies and responsibilities, arrangements regarding the design of risk management and control processes, as well as arrangements for compliance with regulatory and other requirements (e.g. data protection) **(EBA guidelines on internal governance, paragraph 16 and 24−28).**

The organisation‘s policy must be constructed in a way to allow entrance to the material examination for the internal audit. In general, essential actions and determinations for compliance with the minimum requirements have to be documented understandable. The documents have to be systematically, written understandably for third parties and must be kept for two years at least. The internal audit should, at any time, be guaranteed a complete and unlimited right of information. The internal audit is directly subordinated and reporting to the executive board **(EBA guidelines on internal governance, paragraph 29).**

The risk management and control processes should ensure the identification, evaluation, control/surveillance and communication of the major risks and should be integrated into a total system for income and risk management. The considered risks in the risk-bearing capacity must periodically undergo a scenario analysis (= stress tests). Management and

supervisory board must be kept regularly informed of the risk situation and the results of the scenario analysis **(Article 97 CRD IV).**

Member States shall, in accordance with the principle of proportionality, ensure that institutions have a risk management function independent from the operational functions and which shall have sufficient authority, stature, resources and access to the management body (Article 76 CRD IV). The management body in its supervisory function and, where a risk committee has been established, the risk committee must have adequate access to information on the risk situation of the institution and, if necessary and appropriate, to the risk management function and to external expert advice. The risk management function has to be actively involved in elaborating the institution's risk strategy and in all material risk management decisions and be able to deliver a complete view of the whole range of risks of the institution.

In addition, Member States shall ensure that the risk management function can report directly to the management body in its supervisory function, independent from senior management, and can raise concerns and warn that body, where appropriate, where specific risk developments affect or may affect the institution. If necessary, risk reporting should include proposals for action. Information that is essential from risk perspective has to be passed on immediately. The head of the risk management function shall be an independent senior manager with distinct responsibility for the risk management function. Where the nature, scale and complexity of the activities of the institution do not justify a specially appointed person, another senior person within the institution may fulfil that function, provided there is no conflict of interest. The head of the risk management function shall not be removed without prior approval of the management body in its supervisory function and shall be able to have direct access to the management body in its supervisory function where necessary **(Article 76 CRD IV, paragraph 5).**

Special requirements concerning the internal control system as well as structure and workflow organisation: The principle of separation of functions says that the fields of front office and trading have to be separated from the fields of back-office and the functions of risk control and execution, including the executive board (Front-office: initiating business operations and having a voting right at decisions. Back-office: fields not related to "front-office" and having an additional voting right, independent of the "front-office"). In general, larger banks have these functions in a dedicated executive area or a separate CRO is provided for the back office, if required by the scope and complexity of the business, otherwise it is possible within the field of the CFO. The accounting should also be settled as

an independent department by the front-office and trading department because of the large margin of scope of valuation in certain trading activities. The aim of this separation of functions is the avoidance of conflicts of interests (profit-oriented interests vs. risk-based interests) and the further development of risk management **(Article 88 CRD IV in conjunction with the EBA guidelines on internal governance, Title II requirements).**

This functional separation also applies to decisions in which the supervisory body is involved, i.e. the consent of the supervisory body does not substitute the vote of the “back-office”.

The recommendation of functional separation does not apply to areas that are necessarily associated with the overall business management. Therefore, the overall responsibility of the executive board is not affected.

Examples of possible conflicts of interest in the field of treasury/securities:

External	Internal
▸ Separation proprietory trading - customer	▸ Determination of transfer prices (interst rate, liquidity)
▸ Separation dealings on the bank‘s own behalf – fund business	▸ Determination of capital and interest commitments (risk)
▸ Minimum ressources for the customer business	▸ Detection/identification/measurement of risks
▸ Minimum ressources for the fund busines	▸ Differentiation proprietory trading/Asset Liability Management

Compliance market organisation/non-market organisation: It is necessary that the responsible persons and/or bodies are clearly defined; furthermore, it has to be paid attention to a proper separation of functions in order to avoid any conflicts of interest. The executive board must ensure that an adequate risk management is available that is responsible for the measurement, monitoring and steering of (interest rate) risks and where all relevant business areas of the bank are recorded. The persons entrusted with risk management know all the types of risks in the bank and are equipped with the necessary degree of independence of those people who take risk positions. If the interest rate is translated as “market risk in the banking book” that means that a balance sheet and liquidity management in the area of the CFO can perceive mainly risk hedging functions and make proposals for the design of the balance sheet structure within the risk policy and risk strategy. The proposals have then to be approved by the whole board in the ALM Committee. The market access for taking the positions within the limits set by the Asset and Liability Management must be performed then

by a market department. In this sense, the interface between the Treasury and Balance Sheet Management is critical for compliance.

Profit center and bonus/malus: Subsidies or bonuses, also used temporarily as part of sales activities, have to be applied in principle outside of the transfer pricing system. Thus, a dilution of the TP system is avoided and management steering impulses are set deliberately. A consistent integration of the results of the transfer price building into the risk and earnings figures of a credit institution is a prerequisite for the development of the desired steering effect.

This includes on the one hand the full internal risk transfer of all market and liquidity risks between ALM and market areas **(CEBS Guidelines on liquidity cost benefit allocation, 27.10.2010).** On the other hand, the determined transfer prices of the planning and pre-calculation of new business processes up to the segment reporting need to be integrated into the whole process of return management in the profit centers. To avoid conflicts of interest it is recommended to bundle the TP functions of the ALM in a unit and not to impose this unit with earnings targets, but to set up a service center.

Due to the high importance of the TP system it is also necessary to implement monitoring processes by independent third parties, e.g. risk controlling-, bank controlling units. In addition to the validation of the developed methods, models and procedures of the transfer pricing system and its consistent application, the market conformity of the liquidity costs must be checked. Finally, the controlling units are responsible for ensuring the integration of the TP system in the planning process and sales management. The sales management includes the processes for performance measurement in the precalculation as well as the contribution margin accounting on product, customer and profit center level.

Corporate Governance: In a number of banks shortcomings in corporate governance were observed that led to excessive risk taking and contributed to the financial crisis.

Therefore, in particular the regulations were revised that determine to what extent members of the management body of banks may exercise additional mandates in the board of directors or supervisory board of other companies.

In order to effectively monitor the actions and decisions of the executive board, the management body should devote sufficient time to the execution of its duties and assess the activities of the institution, its main risks and the impacts of the business and risk strategy.

Too many management or supervisory mandates would prevent a member of the board to devote sufficient time to its supervisory duties. For this reason, the number of mandates that can be hold by a member of the management body of an institution at the same time in different companies should be limited **(Preamble [58] CRD IV).**

The requirements on the business organisation and the responsibility of the directors were tightened under the CRD IV and the position of the supervisory board of the credit institutions was strengthened. In particular, the requirements on the members of the supervisory board have been revised in order to set a level of qualification that enables the persons concerned to be able to actually perceive their supervisory function.

The strengthening of the supervisory board is supplemented by new regulations on the institution‘s internal control of the decision-making processes of the management board. Therefore, new committees (risk committee und audit committee according to Article 76 CRD IV in conjunction with the EBA guidelines on internal governance, Paragraph 14, nomination committee according to Article 88 CRD IV, remuneration [control] committee according to Article 95 CRD IV) must be established at the institutions that should pay attention on both the qualification of the senior staff of an institution as well as the risks incurred (Article 76 CRD IV). Smaller institutions are not affected by the establishment of such committees, because the legislature has provided that the mentioned committees must be set up in dependence on the size (> 1 billion total assets), the complexity and risk content of the transactions of the credit institution.

Fit & proper – Regulatory requirements for the management in credit institutions

The EBA published in November 2012 guidelines on the assessment of the suitability of members of the management body and key function holders (so-called. “fit & proper” guidelines). Therein, it is shown what the EBA means by adequate supervisory practices within the ESFS (European System of Financial Supervision). The national supervisory authorities and the banks had to implement the new guidelines until 22 May 2013.

The managers must be professionally qualified/suitable and reliable for the management of an institution and devote sufficient time to the performance of their duties. The suitability requires that the directors must have sufficient theoretical and practical knowledge in the relevant business and management experience (so-called. “fit and proper” requirements).

The EBA guidelines contain definitions concerning the staff suitability test that also relate to the staff in ALM as holders of or employees in key positions are concerned. Holders of key positions are employees that have a significant influence on the direction of the credit institution, but are not members of the management or the supervisory board.

The positions that are affected can be identified by using the following criteria:

- Required training and/or experience
- Professional specialised knowledge
- Complexity and flexibility requirements of the demanded function
- Strategic and entrepreneurial design framework
- Management responsibility
- Implications of decisions and risk of erroneous decisions
- Effects of decisions on related areas and functions
- Substitutability

The EBA directive requires all institutions to implement the following points that should be assessed by the supervisory authorities taking into account the nature, scope and complexity of the banking business:

- Appropriate guidelines for assessing the suitability of the management body and key function holders
- Regular assessment of qualification as possible before the position is taken with appropriate documentation of suitability
- Rules for staff succession planning; Statement of the persons who are responsible for the catalogue of suitability criteria and the suitability tests

The assessment of staff qualification has to take into account primarily the following theoretical knowledge and practical experience, in doing so the survey process is highlighted in the assessment method:

- Interpretation of the financial information of a credit institution and based on this appropriate controls and measures
- Financial markets, regulatory frameworks and regulatory requirements
- Risk management (identification, assessment, monitoring, control, mitigation of all material risks of the institution and responsibilities of each member of the management and supervisory board)
- Strategic planning and understanding of the business strategy, business plan, including implementation
- Compliance, governance, supervision and control

If an institution does not comply with the EBA guidelines on staff qualification examination ("fit and proper" test), according to the EBA's opinion the national supervisor has basically to proceed as follows:

- If an institution provides no or insufficient information on the suitability, the competent authorities should disagree to the appointment of the person or not approve.
- If a person is classified as not suitable, the competent authorities should either require the institution not to hire the person or if the person is already been hired,measures for the exchange.
- If the measures taken by the institute are insufficient, the competent supervisory authorities should themselves take appropriate corrective action.

In addition to the "fit and proper" requirements of the banking authority the following requirements of CRR/CRD IV with relevance to the ALM should be mentioned at this point:

According to CRD IV administrative sanctions against the management, supervisory board and other individuals who are responsible under national law for the infringement are provided for breaches of duty (Article 65 CRD IV). The Member States shall ensure in accordance with Article 68 CRD IV that all unchallengeable administrative sanctions are promptly disclosed on the homepage of the banking supervisor, including information on the nature of the infringement.

- Appropriate policies and procedures for the management of risks (Article 88 CRD IV).
- Appropriate scope and nature of risk reporting systems and risk measurement systems (Article 76 CRD IV).
- Internal models must be documented so that the model assumptions are understandable for the supervisory authority. As part of the bank‘s internal controls the completeness and accuracy of the model parameters and model results have to be estimated regularly and the focus has to be placed on the detection and limitation of potential errors that are caused by weaknesses in the model. It should be possible to transparently estimate the key assumptions and parameters that are used in the model. The Asset Liability Management is aware of the weaknesses of the models used and knows how those are best considered in the valuation results. The models of the institutes are regularly reviewed to determine the accuracy of the results and to compare the actual close out values with the model results (Article 175 CRR in conjunction with 77 CRD IV).

Remuneration

The principles of corporate governance (Articles 88−96 CRD IV) also include the rules on remuneration policies of credit institutions (Article 92−95, in addition Article 75 CRD IV). The financial market crisis showed that by means of an inappropriate remuneration policy disincentives were set. These disincentives led to the taking of risks by financial market players that endanger not only the stability of individual financial institutions, but also the financial stability in general. Already with the CRD III first regulations were adopted that should help to avoid disincentives in the area of remuneration policy, e.g. the delayed payment of variable compensation components (Directive 2010/76/EU of 24 November 2010 amending Directives 2006/48/EC and 2006/49/EC as regards capital requirements for the trading book and for re-securitisations, and the supervisory review of remuneration policies; Article 136/156).

With the CRD IV these rules were crucially extended. Basically, the banks have to set appropriate ratios between the fixed and variable annual compensation for employees and directors. The variable remuneration must not exceed 100% of the fixed remuneration, unless the supervisory body of the credit institution acts by a corresponding majority a higher ratio which again must not exceed 200% (Article 94 CRD IV). Thus, the CRD IV has created a groundbreaking rule that goes beyond Basel 3 to limit disincentives for employees and directors in risk taking.

Outsourcing

While the EBA Guidelines on internal governance focus on the outsourcing policy, the CEBS Guidelines on outsourcing (14.12.2006) deal with specific aspects of outsourcing.

Management and supervisory boards have to approve the outsourcing policy of the institute and to assess it regularly. As part of the outsourcing policy the impact of outsourcing on the business activities of an institution as well as its risk situation (e.g. operational risks and reputational- and concentration risks) should be considered.

The outsourcing policy should extend to the rules on reporting and monitoring that have to be implemented from the beginning to the end of an outsourcing agreement (including the preparation of a business case for outsourcing, completion of an outsourcing contract, performance of the contract by the end, emergency plans and exit strategies). The outsourcing policy should be regularly reviewed and updated, changes should be implemented on time.

The ultimate responsibility for the proper management of the risks associated with outsourcing or the outsourced activities lies with an outsourcing institution's senior management.

Outsourcing arrangements can never result in the delegation of senior management's responsibility. An outsourcing institution should take particular care when outsourcing material activities. The outsourcing institution should adequately inform its supervisory authority about this type of outsourcing. The outsourcing of core management functions is considered generally to be incompatible with the senior management's obligation to run the enterprise under their own responsibility. Core management functions include, inter alia, setting the risk strategy, the risk policy, and, accordingly, the risk-bearing capacity of the institution. Hence, management functions such as the setting of strategies and policies in respect of the authorised entity's risk profile and control, the oversight of the operation of the entity's processes, and the final responsibility towards customers and supervisors should not be outsourced.

An outsourcing institution should take special care when outsourcing material activities. The outsourcing institution should inform its supervisory authority about this type of outsourcing appropriately.

Material activities

(i) activities of such importance that any weakness or failure in the provision of these activities could have a significant effect on the authorised entity's ability to meet its regulatory responsibilities and/or to continue in business;

(ii) any other activities requiring a licence from the supervisory authority;

(iii) any activities having a significant impact on its risk management; and

(iv) the management of risks related to these activities.

There are no restrictions on the outsourcing of non-material activities.

Supervisory authorities should require that the outsourcing institution has established supervisory authority access to relevant data held by the outsourcing service provider.

Continuative regulations organisation

Capital Requirement Directive - Capital adequacy of investment firms and credit institutions	Jun.06	EU Directives/Regulations
Guidelines on remuneration policies and practices	Oct.10	EBA/CEBS Guidelines
Directive on the prospectus to be published when securities are offered to the public or admitted to trading	Oct.10	EU Directives/Regulations
Directive 2010/76/EU amending Directives 2006/48/EC and 2006/49/EC as regards capital requirements for the trading book and for re-securitisations, and the supervisory review of remuneration policies (CRD III)	Nov.10	EU Directives/Regulations
Directive 2011/61/EU on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No1060/2009 and (EU) No 1095/2010 as amended by Directive 2013/14/EU	Jun.11	EU Directives/Regulations

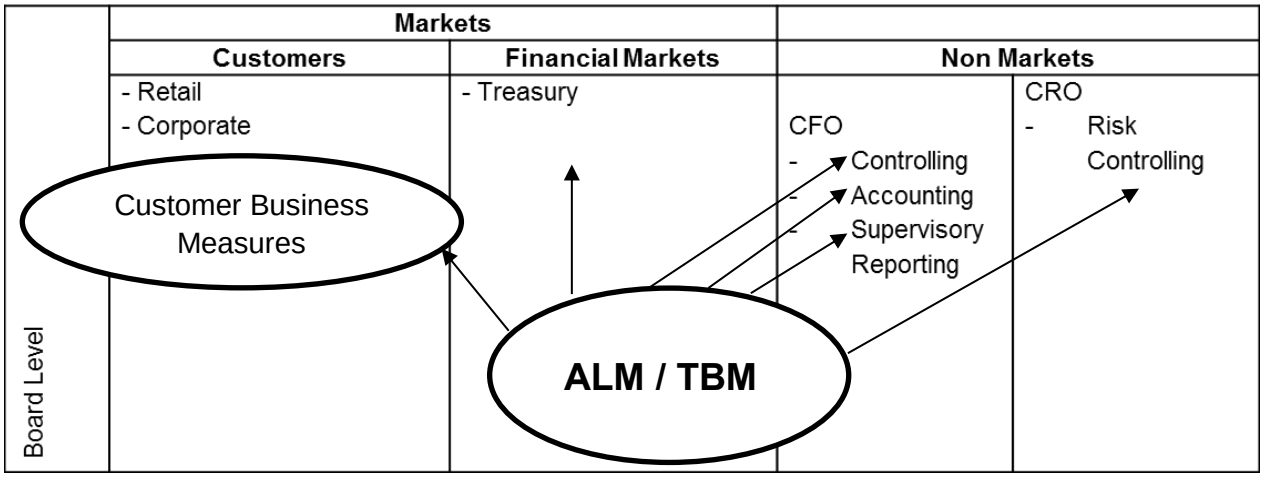
Principles for financial market infrastructures	Apr.12	BIS Standards
European Market Infrastructure Regulation	Jul.12	EU Directives/Regulations
Guideline on the assessment of the suitability of members of the management body and key function holders	Nov.12	EBA/CEBS Guidelines
Directive 2011/89/EU on supplementary supervision of credit institutions, insurance undertaking and investment firms in a financial conglomerate (FICOD)	Dec.12	EU Directives/Regulations
Principles for financial market infrastructures: Disclosure framework and Assessment methodology	Dec.12	BIS Guidelines
Recommendation on the development of recovery plans	Jan.13	EBA/CEBS Recommandation
Recommendation on the development of recovery plans	Jan.13	EBA/CEBS Recommandation
Capital Requirement Directive - Access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms	Jun.13	EU Directives/Regulations
Capital Requirement Regulation - Prudential requirements for credit institutions and investment firms	Jun.13	EU Directives/Regulations
Point of Sale disclosure in the insurance, banking and securities sectors - consultative report	Aug.13	BCBS Guidelines
Single Supervisory Mechanism Regulation	Oct.13	ECB Standards
Regulatory Technical Standards for the definition of material risk takers for remuneration purposes	Dec.13	EBA/CEBS Recommandation

Memorandum of Understanding between the Council of the European Union and the European Central Bank on the cooperation on procedures related to the Single Supervisory Mechanism (SSM)	Dec.13	ECB Detailing
Sound management of risks related to money laundering and financing of terrorism	Jan.14	BIS Standards
Recommendation on the use of the Legal Entity Identifier (LEI)	Jan.14	EBA/CEBS Recommandation
Sound management of risks related to money laundering and financing of terrorism	Jan.14	BCBS Guidelines
Identified Staff	Mar.14	EU Implementing/Regulatory Technical Standards
Instruments used for variable remuneration	Mar.14	EU Implementing/Regulatory Technical Standards
Guideline on the applicable notional discount rate for variable remuneration	Mar.14	EBA/CEBS Guidelines
Guidelines on the applicable notional discount rate for variable remuneration	Mar.14	EBA/CEBS Guidelines
Market Abuse Regulation	Apr.14	EU Directives/Regulations
Market Abuse Directive II	Apr.14	EU Directives/Regulations
Single Supervisory Mechanism Framework Regulation	Apr.14	EU Directives/Regulations
SSM Framework Regulation	Apr.14	ECB Detailing
Bank Recovery and Resolution Directive	May.14	EU Directives/Regulations
Markets in Financial Instruments Regulation (MIFIR)	May.14	EU Directives/Regulations
Markets in Financial Instruments Directive II (MIFID II)	May.14	EU Directives/Regulations
Authorisation of credit institutions	Jun.14	EU Implementing/Regulatory Technical Standards
Technical standards and guidelines for the identification of global systemically	Jun.14	EBA/CEBS Recommandation

important institutions (G-SIIs)		
Guideline on the Remuneration Benchmarking Exercise	Jul.14	EBA/CEBS Guidelines
Guidelines on the data collection exercise regarding high earners	Jul.14	EBA/CEBS Guidelines
Corporate governance principles for banks - consultative document	Oct.14	BCBS Guidelines
Guidelines on Internal Governance	Nov.14	EBA/CEBS Guidelines
Guidelines on the treatment of shareholders in bail-in	Nov.14	EBA/CEBS Guidelines
Guidelines on the rate of conversion of debt to equity in bail-in	Nov.14	EBA/CEBS Guidelines
Market-making and proprietary trading: industry trends, drivers and policy implications	Nov.14	BIS Guidelines
Directive 2003/41/EC on Occupational pensions as amended by Directive 2010/78/EU (OmnibusI)	Jan.15	EU Directives/Regulations
Guidelines on product oversight and governance arrangements for retail banking products (EBA/GL/2015/18)	Jul.15	EBA/CEBS Guidelines

1.8 Interfaces of ALM/TBM and the Bank

Starting point is the organisational model proposed in chapter 2 where ALM/TBM and the ALM department are located in the markets division. Thus the following organisational interfaces will be established.

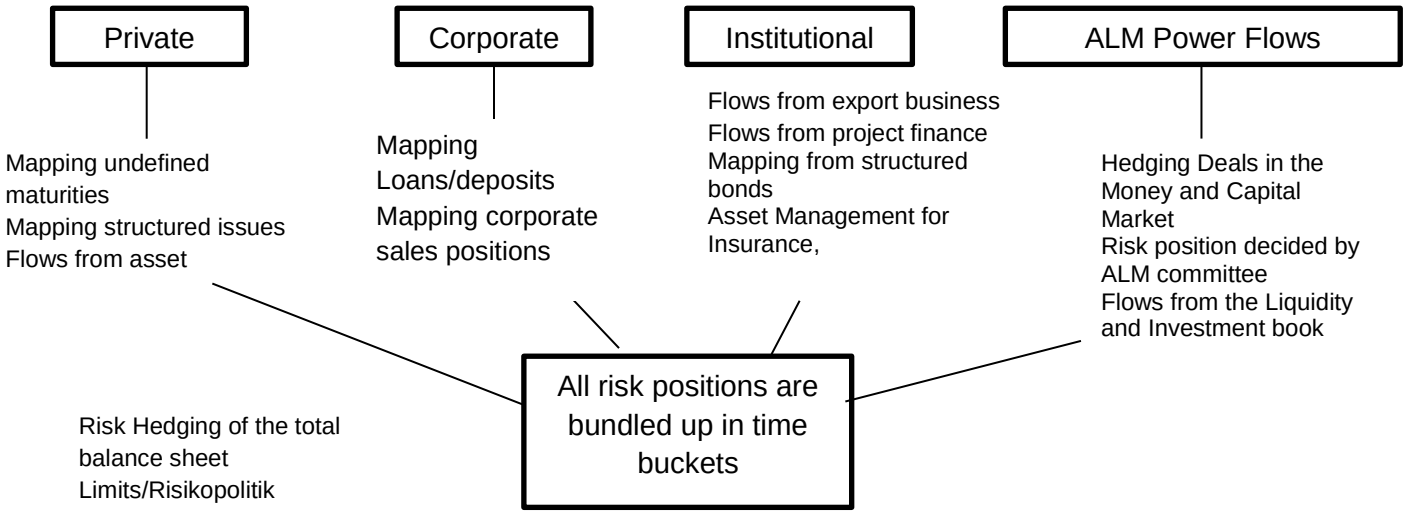


There can be found different organisational set ups but all have the following characteristics common:

- Separation Market – NON Market. If ALM/GBS is organised in NON Market the ALM Department will not execute deals in the markets and will not enter into risk positions not authorised by the ALM/GBS committee.
- Separation of data production and reporting. The ALM department, as an example, will not be responsible for the risk and revenue accounting of its activities.

Interfaces start with customer business. Every single deal is split up into single risk positions, for each risk the single positions will be bundled up creating risk flows.
Identifying and managing these flows is the basis of ALM management and revenue:

Where the main flows come from:



Managing and Hedging the bank's risk positions according to ALM/GBS committee decisions is the core task of ALM (department). A comprehensive overview on ALM tasks can be found in chapter D/ALM Organisation.

Full capture and measurement of all risk is core task of risk controlling. All risk positions will either be bullet positions (spot and term) or will be transformed into bullet positions by mapping models. Transfer Prices and Transfer price modelling is a Controlling task, in collaboration with ALM, Treasury (market know how) and risk (risk measurement methodology). In order to ensure Transfer Price quality Risk controlling, again, is responsible for periodic validation in order to measure risk and revenue correctly.

ALM Interface Tasks of Risk Controlling

Interface Tasks	Full and state of the art risk measurement for all ICAAP risk, including credit portfolio risk)
	Assessment of ICAAP Risk for all relevant risk categories (separately and total) for three different views: Going Concern, Gone Concern (Liquidation); Stress.
	Risk Reporting (Portfolio Risk, Single risk positions, risk per business line) for all risk categories
	Controlling Risk Limits and initiating action in case of violations
	Stresstesting; Back Testing

Proposal for Risk Limits for all ICAAP Risk (derived from risk policy and risk strategy)
Validation of Transfer Prices
Second Vote for Capital Market Counterparts

Creation and continuous updates for the bank´s Risk Manual
Creation and updats of the contingency funding plan

Collaboration within the Product Implementation Process (Risk Measurement, Valuation Curves, Limits,..)
Input in establishing the bank´s risk policy and strategy
Quality control of ALM/GBS manuals

Transfer Pricing requires know how from all parties involved and a good collaboration between markets, controlling, risk controlling, treasury and ALM in order to achieve a state of the art risk and revenue measurement, that it adapted to the individual bank's needs. Otherwise bad Transfer Prices lead to mistakes in risk- and revenue measurement, thus leading to wrong incentives and allocation.

ALM Interfaces with Accounting and Controlling

Interface Tasks		
	Head of department	Collaboration in establishing Risk Policy and –Strategy
		Collaboration within the Product Implementation Process (Transfer Prices, Revenue measurement, accounting rules,..)
		Quality control of ALM/GBS manuals
	Controlling:	Revenue measurement for all ALM/GBS positions; mark to market, accrual and total return
		Profit forecast to Year End
		Deviation analysis ACT/Budget
		Competence Center for the Transfer Price Building (for Interest, Liquidity and other market risk)
		Modelling of Transfer Price Positions (Interest, Liquidity, Credit Spread, FX, Stocks,…)
		Data responsibility for all relevant risk positions and Transfer Prices
	Accounting:	Profit and Loss result – Actual and Budget (Deviation Analysis)
		Synchronisation of ALM result with P&L
		Key Ratio Reporting for the Balance Sheet structure
		Closing Netting Agreements
		Hedge Accounting Strategies (Booking principles, hedging strategies, efficiency testing) to reduce volatility of P&L
	Supervisory Reporting	FINREP and COREP
		Regulator oriented reporting

Controlling is reporting the risk positions and the result achieved with these positons. Controlling is also responsible for the data quality.

Economic profit calculation is based on Total Return (TOR) where the change of market value is added to the accrual of the reporting period. In order to present ALM results in external reporting (P&L) without considerable volatility accounting, together with ALM and Treasury, will have to develop hedging strategies that are adapt for ALM risk strategy of the bank.

Especially reporting frequently poses questions on conflicts of interest. The most frequent solution is

- Responsibility for correct Data is with Controlling, in any case the Finance department will be responsible
- Transfer Price methodology is also with Controlling; Risk controlling checks quality via validation, Treasury supplies daily market rates that are the basis of up to date Transfer Prices.
- Ratios for internal and external Reporting come from accounting or supervisory reporting

The third important interface ALM has with Treasury. If ALM makes part of the non-market organisation it is a must that market access is organised via a markets, frequently via Treasury. Even if ALM, managing the banking book, is located in the markets organisation, execution is frequently done by Treasury.

When handing over positions from ALM to Treasury there is a variety of concepts. Starting with straight execution Treasury may have more flexibility to react on ALM orders. Flexibility may be in timing, position size and product choice, always linked to limits. Goal of flexibility is to earn additional risk income on the timely and continuous management of ALM positions.

ALM Interface with Treasury

Interface Tasks	
	Execution of ALM orders in the Financial market within limits (from immediate execution to intra-day and position limits)
	Money Market: access to all cash and derivative instruments
	Capital Market: access to all cash and derivative instruments
	Hedging of funding transactions
	Collateral Management for Financial Market and Central Bank (ECB) transactions
	Execution of Repo and Tender transactions for funding and placement of liquidity
	Access to direct/indirect Central Bank liquidity

Profit generation on the flows coming from ALM within defined limits
Pricing of Treasury/Financial Market products
Know How Center for Markets and Finacial Markets products

Proposals for ALM measures
Collaboration with ALM in preparing ALM/GBS committee meetings (especially market forecasts)
Market Data feed for the Transfer Price information system

Funding transactions and Institutional sales

Collaboration for the Product Implementation Process (PIP)
Lead Product Implementation of Financial Market products
Collaboration for creating the bank´s Risk Strategy (especially trading strategy and Investment process)
Collaboration in the creation of the contingency funding plan

In addition to these main interfaces of ALM/TBM within a bank‘s organisation the following organizational units will be involved in ALM/TBM work:

- **Customer departments**: input of know-how on customer behaviour. Management of customer demand with products where risk cannot be managed with Financial Market Positions (mainly TBM tasks).
- **IT**, that has to supply all relevant data more and more on an online basis. Data has to be consistent, complete and a drill down to single deals must be possible at any time. These are the rules of Basle regulation BCBS 239.
- **Back office**, where deals have to be processed and reconciliated. Account verification and payments of ALM transactions also make part of back office work.