

# Overview of Basel III

**B**ank executives are in a difficult position. On the one hand their shareholders require an attractive return on their investment. On the other hand, banking supervisors require these entities to hold a substantial amount of expensive capital. As a result, banks need capital-efficient business models to prosper.

Banking regulators and supervisors are in a difficult position as well. Excessively conservative capital requirements may lessen banks' appetite for lending, endangering economic growth. Excessively light capital requirements may weaken the resilience of the banking sector and cause deep economic crises.

## 1.1 INTRODUCTION TO BASEL III

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Basel III's main set of recommendations were issued by the Basel Committee on Banking Supervision (BCBS) in December 2010 (revised June 2011) and titled *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems*.

It is important to note that the BCBS does not establish laws, regulations or rules for any financial institution directly. It merely acts in an advisory capacity. It is up to each country's specific lawmakers and regulators to enact whatever portions of the recommendations they deem appropriate that would apply to financial institutions being supervised by the country's regulator.

### 1.1.1 Basel III, CRR, CRD IV

With a view to implementing the agreements of Basel III and harmonising banking solvency regulations across the European Union as a whole, in June 2013 the European Parliament and the Council of the European Union adopted the following legislation:

- Capital Requirements Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 (hereinafter the "CRD IV"), on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC. CRD IV entered into force in the EU on 1 January 2014; and
- Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (hereinafter the "CRR").

National banking regulators then give effect to the CRD by including the requirements of the CRD in their own rulebooks. The national regulators of the bank supervises it on a consolidated basis and therefore receives information on the capital adequacy of, and sets capital requirements for, the bank as a whole. Individual banking subsidiaries are directly regulated by their local banking regulators, who set and monitor their capital adequacy requirements.

- In Germany, the banking regulator is the Bundesanstalt für Finanzdienstleistungsaufsicht (“BaFin”).
- In Switzerland, the banking regulator is the Swiss National Bank (“SNB”).
- In the United Kingdom, the banking regulator is the Prudential Regulation Authority (“PRA”).
- In the United States, bank holding companies are regulated by the Board of Governors of the Federal Reserve System (the “Federal Reserve Board” or “FSB”).

### 1.1.2 A Brief History of the Basel Accords

Global standards for bank capital are a relatively recent innovation, with an evolution along three phases (see Figure 1.1).

During the financial crises of the 1970s and 1980s the large banks depleted their capital levels. In 1988 the Basel Supervisors Committee intended, through the Basel Accord, to establish capital requirements aimed at protecting depositors from undue bank and systemic risk. The Accord, Basel I, provided uniform definitions for capital as well as minimum capital adequacy levels based on the riskiness of assets (a minimum of 4% for Tier 1 capital, which was mainly equity less goodwill, and 8% for the sum of Tier 1 capital and Tier 2 capital). Basel I was relatively simple; risk measurements related almost entirely to credit risk, perceived to be the main risk incurred by banks. Capital regulations under Basel I came into effect in December 1992, after development and consultations since 1988. Basel I was amended in 1996 to introduce capital requirements to addressing market risk in banks’ trading books.

In 2004, banking regulators worked on a new version of the Basel accord, as Basel I was not sufficiently sensitive in measuring risk exposures. In July 2006, the Basel Committee on Banking Supervision published *International Convergence of Capital Measurement and Capital Standards*, known as Basel II, which replaced Basel I. The supervisory objectives for Basel II were to (i) promote safety and soundness in the financial system and maintain a certain overall level of capital in the system, (ii) enhance competitive equality, (iii) constitute a more comprehensive approach to measuring risk exposures and (iv) focus on internationally active banks.

The unprecedented nature of the 2007–08 financial crisis obliged the Basel Committee on Banking Supervision (BCBS) to propose an amendment to Basel II, commonly called Basel III. Basel III

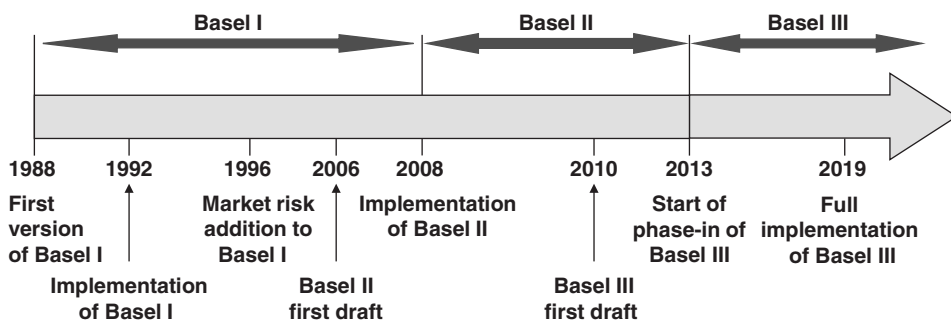


FIGURE 1.1 Bank regulatory capital accords

introduced significant changes in the prudential regulatory regime applicable to banks, including increased minimum capital ratios, changes to the definition of capital and the calculation of risk-weighted assets, and the introduction of new measures relating to leverage, liquidity and funding.

### 1.1.3 Accounting vs. Regulatory Objectives

It is important to make clear that the accounting and regulatory objectives are not fully aligned. The aim of accounting financial statements is the provision of information about the financial position, performance, cash flow and changes in the financial position of an entity that is useful for making economic decisions to a range of users, including existing and potential investors, lenders, employees and the general public.

The main objective of prudential regulation is to promote a resilient banking sector or, in other words, to improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source, thus reducing the risk of spillover from the financial sector to the real economy.

## 1.2 EXPECTED AND UNEXPECTED CREDIT LOSSES AND BANK CAPITAL

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Let us assume that a bank provided a loan to a client. The worst case one could imagine would be that the client defaults and that, as a consequence, the bank loses the entire loaned amount. This event is rather unlikely and requiring the bank to hold capital for the entire loan would be excessively conservative and the bank is likely to pass the cost of the capital requirement to the client, making the loan too costly for the client. Requiring the bank to hold no capital for the loan would compromise the bank's viability if the borrower defaults. Thus, the bank regulator has to require banks to hold capital levels that assure their viability with a high probability, while maintaining their appetite to extend loans to borrowers at reasonable levels.

Credit losses, within a certain confidence interval, on debt instruments may be divided into expected and unexpected losses.

### 1.2.1 Expected Losses

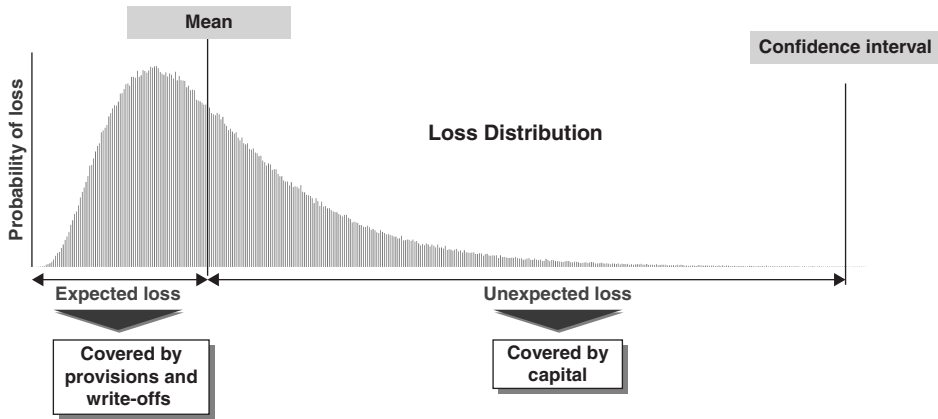
The **expected loss** on a debt instrument is the level of credit loss that the bank is reasonably expected to experience on that instrument. The interest priced on the debt instrument at its inception incorporates the expected loss during the life of the instrument.

Banks are expected in general to cover their expected credit losses on an ongoing basis (e.g. by revenues, provisions and write-offs), as shown in Figure 1.2, because they represent another cost component of the lending business. Bank supervisors need to make sure that banks do indeed build enough provisions against expected losses.

### 1.2.2 Unexpected Losses

The **unexpected loss** on a debt instrument is the level of credit loss in excess of the expected loss that the bank may be exposed to with a certain probability of occurrence. Thus, the size of the unexpected loss depends on the confidence interval chosen. Unexpected losses relate to potentially large losses that occur rather seldomly. In other words, the bank cannot know in advance their timing and severity.

Banks are required to hold regulatory capital to absorb unexpected losses, as shown in Figure 1.2. Thus, risk-weighted assets relate to the unexpected losses only. Bank regulatory capital is needed to cover the risks in such unexpected losses and, thus, it has a loss absorbing function.



**FIGURE 1.2** Expected and unexpected credit losses

### 1.3 THE THREE-PILLAR APPROACH TO BANK CAPITAL

The capital adequacy framework consists of three pillars (see Figure 1.3), each of which focuses on a different aspect of capital adequacy:

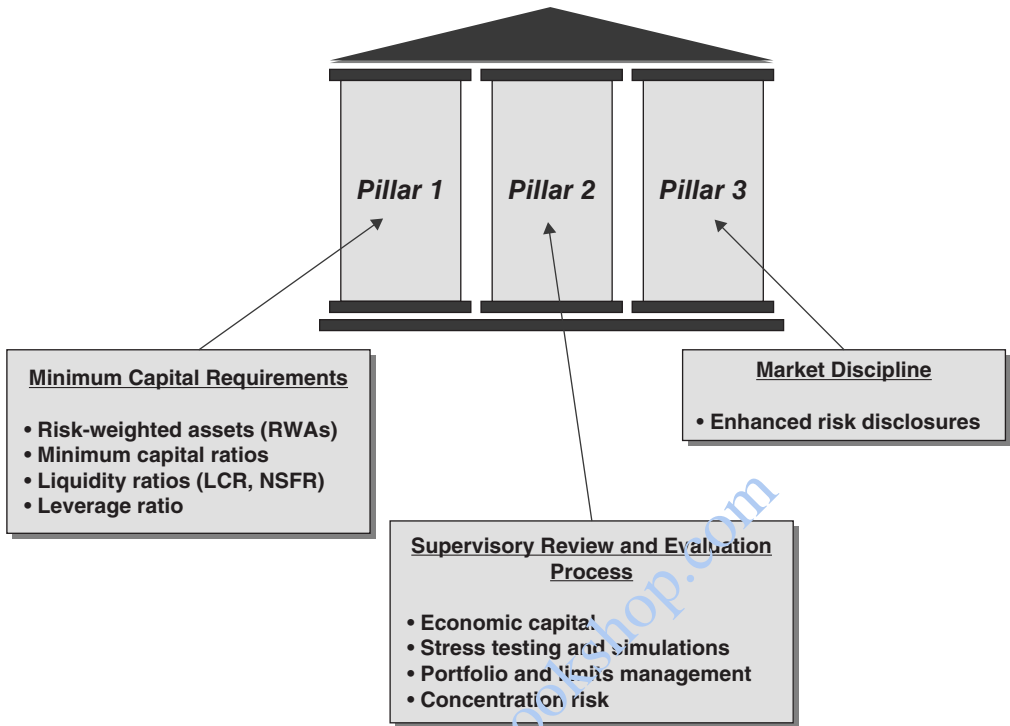
- **Pillar 1**, called “**Minimum Capital Requirements**” establishes the minimum amount of capital that a bank should have against its credit, market and operational risks. It provides the guidelines for calculating the risk exposures in the assets of a bank’s balance sheet (the “risk-weighted assets”) and the capital components, and sets the minimum capital requirements.
- **Pillar 2**, called “**Supervisory Review and Evaluation Process**”, involves both banks and regulators taking a view on whether a firm should hold additional capital against risks not covered in Pillar 1. Part of the Pillar 2 process is the “**Internal Capital Adequacy Assessment Process**” (“ICAAP”), which is a bank’s self-assessment of risks not captured by Pillar 1.
- **Pillar 3**, called “**Market Discipline**”, aims to encourage market discipline by requiring banks to disclose specific, prescribed details of their risks, capital and risk management.

This book focuses on Pillar 1.

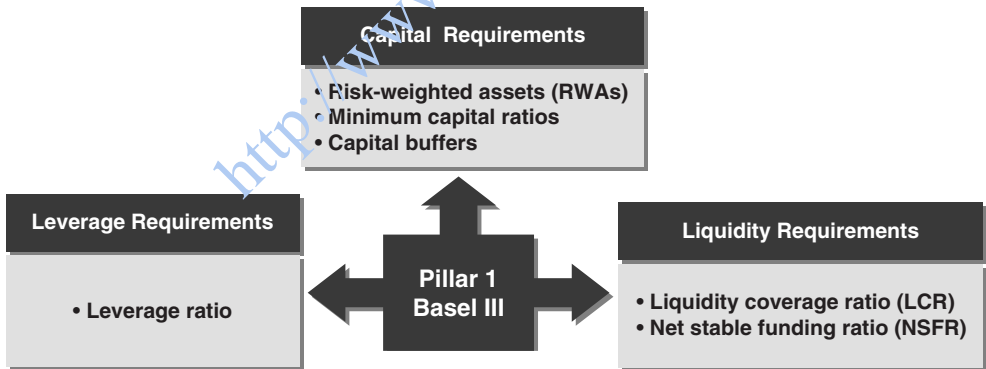
#### 1.3.1 Pillar 1 – Minimum Capital Requirements

Pillar 1 covers the calculation of capital, liquidity and leverage levels (see Figure 1.4). Pillar 1 covers as well the calculation of risk-weighted assets for credit risk, market risk and operational risk. Distinct regulatory capital approaches are followed for each of these risks.

**Leverage Ratio** One of the causes of the 2007–08 financial crisis was the build-up of excessive balance sheet leverage in the banking system, despite meeting their capital requirements. It was only when the banks were forced by market conditions to reduce their leverage that the financial system increased the downward pressure in asset prices. This exacerbated the decline in bank capital. To prevent the excessive deleveraging from happening again, Basel III introduced a leverage ratio. This ratio was designed to put a cap on the build-up of leverage in the banking system as well as to introduce



**FIGURE 1.3** The three pillars around Basel III



**FIGURE 1.4** Pillar 1 of Basel III

additional safeguards against model risk and measurement errors. The leverage ratio is a simple, transparent, non-risk-weighted measure, calculated as an average over the quarter:

$$\text{Tier 1 leverage ratio} = \frac{\text{Tier 1 capital}}{\text{Average total restated balance sheet assets}}$$

Balance Sheet	
Highly liquid assets	Net 30-day outflows
Other assets	Other liabilities
	Shareholders' equity

**FIGURE 1.5** Liquidity coverage

**Liquidity Coverage Ratio** Banks experienced severe liquidity problems during the 2007–08 financial crisis, despite meeting their capital requirements. Basel III requires banks to hold a pool of highly liquid assets which is sufficient to maintain the forecasted net cash outflows over a 30-day period, under stress assumptions (see Figure 1.5). This requirement tries to improve a bank's resilience against potential short-term liquidity shortages. The ratio is calculated as follows:

$$\text{Liquidity Coverage Ratio (LCR)} = \frac{\text{Stock of high-quality liquid assets (HQLAs)}}{\text{Net cash outflows over a 30-day time period}} \geq 100\%$$

Assets are considered “highly liquid” if they can be quickly converted into cash at almost no loss.

All assets in the liquidity pool must be managed as part of that pool and are subject to operational requirements. The assets must be available for the treasurer of the bank, unencumbered and freely available to group entities.

**Net Stable Funding Ratio** Basel III requires a minimum amount of funding that is expected to be stable over a one-year time horizon based on liquidity risk factors assigned to assets and off-balance sheet exposures. This requirement provides incentives for banks to use stable sources to fund banks' balance sheets, off-balance sheet exposures and capital markets activities, therefore reducing the refinancing risks of a bank. The Net Stable Funding Ratio (NSFR) establishes the minimum amount of stable funding based on the liquidity characteristics of a bank's assets and activities over a more than one-year horizon. In other words, a bank must hold at least an amount of long-term (i.e., more than one year) funding equal to its long-term (i.e., more than one year) assets. The ratio is calculated as follows:

$$\text{Net Stable Funding Ratio (NSFR)} = \frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} \geq 100\%$$

The numerator is calculated by summing a bank's liabilities, weighted by their degree of permanence. The denominator is calculated by summing a bank's assets, weighted by their degree of permanence.

### 1.3.2 Pillar 2 – Supervisory Review and Evaluation Process

Pillar 2 is an additional discipline to evaluate the adequacy of the regulatory capital requirement under Pillar 1 and other non-Pillar 1 risks. Pillar 2 refers to the possibility for national supervisors to impose a wide range of measures – including additional capital requirements – on individual institutions or groups of institutions in order to address higher-than-normal risk.

Pillar 2 has two aspects. The first requires banks to regularly assess their overall risk profile and to calculate any further capital that should be held against this additional risk. This assessment is called ICAAP. Pillar 1 captures exposures to credit risk, market risk and operational risk. Exposures to risks not captured by Pillar 1 are assessed in Pillar 2. These include credit concentration risk, liquidity risk, reputation and model risk. Consequently, Pillar 2 could add requirements to the amount of capital held by banks (and offset the lower credit-risk capital requirement).

The second aspect of Pillar 2 is its inclusion of a “supervisory review process”. In the case of the European Union, the supervisory authorities assess how banking institutions are complying with EU banking law, the risks they face and the risks they pose to the stability of the financial system. This allows supervisors to evaluate each bank’s overall risk profile and, if needed, to mandate a higher prudential capital ratio where this is judged to be prudent.

**ICAAP – Internal Capital Adequacy Assessment Process** Banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels. This assessment is called ICAAP – Internal Capital Adequacy Assessment Process. ICAAP assesses the amounts, types and distribution of capital that it considers adequate to cover the level and nature of the risks to which it is or might be exposed. This assessment should cover the major sources of risks to the firm’s ability to meet its liabilities as they fall due and incorporate stress testing and scenario analysis.

ICAAP is documented and updated annually by the firm or more frequently if changes in the business, strategy, nature or scale of its activities or operational environment suggest that the current level of financial resources is no longer adequate.

### 1.3.3 Pillar 3 – Market Discipline

Pillar 3 requires disclosure of information regarding all material risks and the calculation of bank capital positions. Pillar 3 also requires the disclosure of exposures and associated risk-weighted assets for each risk type and approach to calculating capital requirements for Pillar 1.

Its objective is to help investors and other stakeholders to assess the scope of application by a bank of the Basel framework and the rules in their jurisdiction, their capital condition, risk exposures and risk assessment processes, and hence their capital adequacy.

This dimension of Basel III is designed to complement Pillars 1 and 2 by providing additional discipline on bank risk-taking behaviour. The idea is that banks which the market judges to have increased their risk profiles without adequate capital may witness their securities sold down in debt and equity markets. The additional costs that this will impose on financing bank operations will provide an incentive for management to modify either the bank’s risk profile or its capital base.

### 1.3.4 Significant Subsidiaries Disclosure Requirements

[CRR 13(1)] (“Application of disclosure requirements on a consolidated basis”) requires that significant subsidiaries of EU parent institutions, and those subsidiaries which are of material significance for their local market, disclose information specified in the following articles on an individual or sub-consolidated basis:

- Own funds [CRR 437];
- Capital requirements [CRR 438];
- Capital buffers [CRR 440];
- Credit risk adjustments [CRR 442];
- Remuneration Policy [CRR 450];
- Leverage [CRR 451]; and
- Credit risk mitigation techniques [CRR 453].

[CRR 13(1)] does not provide explicit criteria for the determination of significant subsidiaries or those subsidiaries which are of material significance for their local market. Commonly, a banking group defines certain quantitative and qualitative criteria to determine which subsidiaries are subject to the requirements set forth in [CRR 13(1)]. These criteria take into account the subsidiary's significance to the group as well as the subsidiary's importance to its local market using quantitative measures such as total assets and RWAs in relationship of the group's consolidated assets and RWAs, as well as certain qualitative aspects of the subsidiary's standalone systemic importance to their local markets using designations and measures as defined by local regulators.

## 1.4 RISK-WEIGHTED ASSETS (RWAs)

When assessing how much capital a bank needs to hold, regulators weigh a bank's assets according to their risk. Safe assets (e.g., cash) are disregarded; other assets (e.g., loans to other institutions) are considered more risky and get a higher weight. The more risky assets a bank holds, the higher the likelihood of a reduction to earnings or capital, and as a result, the more capital it has to have. In addition to risk weighting on-balance sheet assets, banks must also risk weight off-balance sheet exposures such as loan and credit card commitments.

The risk-weighted assets ("RWAs") are a bank's assets and off-balance sheet items that carry credit, market, operational and/or non-counterparty risk (see Figure 1.6):

- **Credit risk:** RWAs reflect the likelihood of a loss being incurred as the result of a borrower or counterparty failing to meet its financial obligations or as a result of deterioration in the credit quality of the borrower or counterparty.
- **Market risk:** RWAs reflect the risk due to volatility of in the fair values of financial instruments held in the trading book in response to market movements – including foreign exchange, commodity prices, interest rates, credit spread and equity prices – inherent in both the balance sheet and the off-balance sheet items.
- **Operational risk:** RWAs reflect the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.
- **Other risks:** RWAs primarily reflect the capital requirements for equity positions outside the trading book, settlement risk, and premises and equipment.

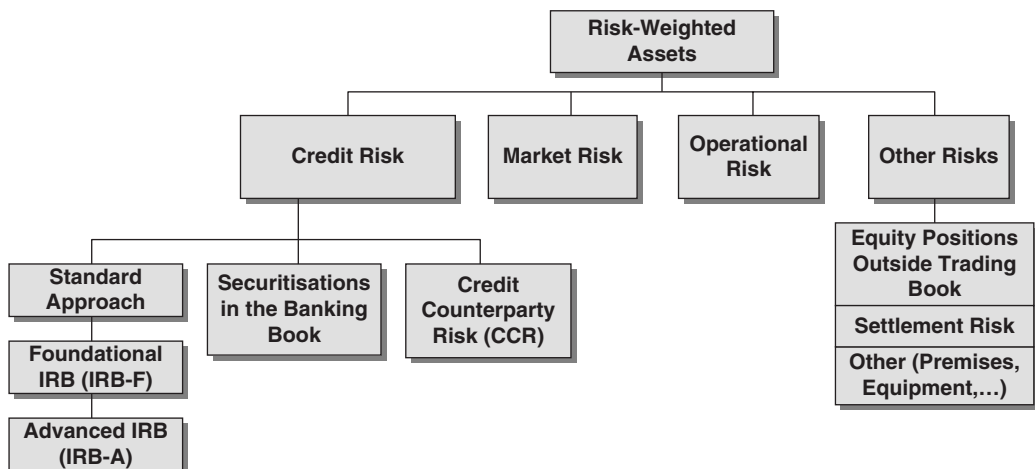


FIGURE 1.6 Main components of RWAs



### 1.4.1 Calculation of Credit Risk RWAs

Basel III applies two approaches of increasing sophistication to the calculation credit risk RWAs:

- **The standardised approach** is the most basic approach to credit risk. It requires banks to use external credit ratings to determine the RWAs applied to rated counterparties, based on a detailed classification of asset and counterparty types. Other counterparties are grouped into broad categories and standardised risk weightings are applied to these categories using standard industry-wide risk weightings.
- **The internal ratings-based approach (IRB)**. The credit RWAs calculation under this approach is based on an estimate of the exposure at default (EAD), probabilities of default (PD) and loss given default (LGD) concepts, using bank-specific data and internal models that are approved by the regulator. The IRB approach is further sub-divided into two applications:
  - **Advanced IRB (AIRB)**: where internal calculations of PD, LGD and credit conversion factors are used to model risk exposures;
  - **Foundation IRB (FIRB)**: where internal calculations of probability of default (PD), but standardised parameters for LGD and credit conversion factors are used.

### 1.4.2 Calculation of Counterparty Credit Risk (CCR) RWAs

Counterparty credit risk (CCR) arises where a counterparty default may lead to losses of an uncertain nature as they are market-driven. This uncertainty is factored into the valuation of a bank's credit exposure to such transactions. The bank uses two methods under the regulatory framework to calculate CCR credit exposure:

- **The mark to market method (MTM, also known as current exposure method)**, which is the sum of the current market value of the instrument plus an add-on (potential future exposure or PFE) that accounts for the potential change in the value of the contract until a hypothetical default of the counterparty.
- **The internal model method (IMM)**, subject to regulatory approval, allows the use of internal models to calculate an effective expected positive exposure (EPE), multiplied by a factor stipulated by the regulator.

### 1.4.3 Calculation of Market Risk RWAs

RWA calculations for market risk assess the losses from extreme movements in the prices of financial assets. Under the regulatory framework there are two methods to calculate market risk:

- **Standardised approach**: A calculation is prescribed that depends on the type of contract, the net position at portfolio level and other inputs that are relevant to the position. For instance, for equity positions a specific market risk component is calculated that depends on features of the specific security (for instance, country of issuance) and a general market risk component captures changes in the market.
- **Model-based approach**: With their regulator's permission, firms can use proprietary Value-at-Risk (VaR) models to calculate capital requirements. Under Basel III, Stressed VaR, Incremental Risk Charge and All Price Risk models must also be used to ensure that sufficient levels of capital are applied.

### 1.4.4 Calculation of Securitisation Exposures RWAs

Securitisation exposures that fulfil certain criteria are treated under a separate framework to other market or credit risk exposures. For trading book securitisations, specific risk of securitisation transactions is calculated following standardised market risk rules; general market risk of securitisations is

captured in market risk models. For securitisations associated with non-traded banking books, the following approaches are available to calculate risk-weighted assets:

- **Standardised approach:** Where external ratings are available for a transaction, look-up tables provide a risk weight to apply to the exposure amount. For unrated securitisations, depending on the type of exposure and characteristics, standard weights of up to 1250% are applied.
- **Advanced approaches include:**
  - **The ratings-based approach**, where external ratings are available, allows for a more granular assessment than the equivalent standardised approach.
  - For unrated transactions, the “**look through**” approach can be used, which considers the risk of the underlying assets.
  - The **internal assessment approach** can be used on unrated asset-backed commercial paper programmes; it makes use of internal models that follow similar methodologies to rating agency models.

#### 1.4.5 Calculation of Operational Risk RWAs

Capital set aside for operational risk is deemed to cover the losses or costs resulting from human factors, inadequate or failed internal processes and systems or external events. To assess capital requirements for operational risk, the following methods apply:

- **Basic indicator approach (BIA):** Sets the capital requirement as 15% of the net interest and non-interest income, averaged over the last three years. If the income in any year is negative or zero, that year is not considered in the average.
- **Standardised approach:** Under this approach net interest and non-interest income is classified into eight business lines as defined by the regulation. The capital requirement is calculated as a percentage of the income, ranging between 12% and 18% depending on the business line, averaged over the last three years. If the capital requirement in respect of any year of income is negative, it is set to zero in the average calculation.
- **Advanced management approach (AMA):** Under the AMA the firm calculates the capital requirement using its own models, after review and approval of the model and wider risk management framework by the regulator.

#### 1.4.6 Link between RWAs and Capital Charges

The link between capital charges and RWAs is the following:

