# Topic 4 Capital

## Learning objectives

In this topic we shall cover:

* what capital is and why banks hold capital;
* why we need regulation;
* the Bank for International Settlements (BIS);
* the Basel Committee on Banking Supervision (BCBS);
* development of the Basel Accords;
* the purpose of:
  + risk-weighted assets;
  + the liquidity coverage ratio;
  + the net stable funding ratio.

## 4.1 Capital and regulation

Banks take risks and may incur losses. Banks hold capital to ensure they can protect depositors and to ensure the stability of the financial system in good and bad times. In other words, capital is the combination of “financial resources a bank has that act as a cushion or shock-absorber against unexpected losses” (Bank of England, 2021), for example borrowers failing to repay loans.

The amount of capital a bank requires depends on the level of risk it takes. The higher the risks, the higher the amount of capital required. To ensure the capital a bank holds remains sufficient, banks continuously assess their risks and potential losses. These assessments are reviewed and challenged by regulatory authorities. Regulatory capital is the amount of capital that a regulatory authority requires a bank to hold based on its risk profile.

### Why do we need regulation?

For any market to operate efficiently and effectively, some regulation is needed. The purpose of regulation is to provide a:

* **level of trust** to all stakeholders; and
* **level of stability** to the overall market.

In a financial market, regulation ensures that both suppliers of capital (depositors and investors) and users of capital (borrowers) know that the market is trustworthy and will act to channel funds efficiently from depositors to investors. Depositors get a return for making funds available and taking a risk.

**IN BRIEF: Challenge of regulation**

A well-regulated market is likely to result in greater competitiveness that, in turn, leads to lower prices and a higher quantity traded, thus resulting in economic growth. The challenge is to find the appropriate level of regulation that is neither:

* **too stringent** so that it stops financial institutions from doing business; nor
* **too light** so that stability of the financial market is jeopardised.

### 4.1.1 Role of regulators

One of the main roles of regulators is to maintain stability of financial markets by reducing the likelihood that the banking system will fail. As such, regulators:

* **facilitate creation** of codes of conduct and regulations;
* **monitor implementation** of codes and regulations; and
* **impose sanctions** on market participants that violate codes or regulations.

The main global standard-setting body is the BIS (see section 4.2). Each country typically has either a single regulator – its central bank – or one or more regulatory authorities, among which may be a prudential regulator and a conduct regulator.

**Table 4.1 Advantages and disadvantages of financial regulation**

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| **Advantages** | **Disadvantages** |
| Maintain stability of financial markets  Enhance transparency  Protect against fraud  Protect investors and consumers | Barriers to entry  Hampering market forces  Costs for banks and regulators  Moral hazard |

**Moral hazard**

Lack of motivation to try to avoid risk when protected from its consequences, for example by insurance.

In financial services, moral hazard can occur due to deposit protection schemes that guarantee depositors are repaid up to a set limit if the bank is unable to repay. As this protection is in place, banks may take unnecessary risks.

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| **FACTFIND**  Find out about:  [Singapore Deposit Insurance Corporation (SDIC](https://www.sdic.org.sg/))  [UK Financial Services Compensation Scheme (FSCS)](https://www.fscs.org.uk/)  [US Federal Deposit Insurance Corporation (FDIC)](https://www.fdic.gov/resources/deposit-insurance/)  [EU deposit guarantee schemes](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/financial-supervision-and-risk-management/managing-risks-banks-and-financial-institutions/deposit-guarantee-schemes_en) |

### 4.1.2 Types of financial regulation

We can classify the types of financial regulation as follows.

**Table 4.2 Types of financial regulation**

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| **Type** | **Description** |
| External regulation | Regulation originating from public sector organisations representing the government, such as the BIS, and local central banks and regulators such as the European Central Bank, the Federal Reserve in the US and the PRA in the UK.  The regulations cover any aspect of a financial institution’s business operations, ranging from liquidity and capital adequacy requirements to the qualifications to be held by staff in key roles. Key types of regulators are:   * prudential regulators; and * conduct authorities. |
| Self-regulation | Regulation originating from within the industry and voluntarily accepted, to provide market discipline and make business easier to transact. For example, it may relate to standardisation of documentation or agreements relating to the responsibilities of parties in transactions. Examples of self-regulation organisations include:   * **Financial Industry Regulatory Authority (FINRA)**: writes and enforces the rules governing registered brokers and [broker-dealer](https://www.investopedia.com/terms/b/broker-dealer.asp) firms in the US; * **IOSCO**: see section 1.4.2; * **IASB**: see section 1.4.2; * **International Swaps and Derivatives Association (ISDA)**: standardised contracts for over-the-counter derivatives transactions. |

### 4.1.3 Prudential regulation

Prudential regulation focuses on ensuring the soundness of banks, as opposed to regulating their business activities. This includes ensuring that a bank, and the financial industry, has sufficient financial strength to cope with any financial shocks that could occur. Therefore, prudential regulation involves aspects such as capital adequacy and liquidity. The main purpose of prudential regulation is to reduce the likelihood of an individual bank failing as well as the failure of the whole financial market.

**Figure 4.1 What do prudential regulations typically include?**

### 4.1.4 Conduct of business

Conduct of business regulation focuses on business functions, irrespective of the institutions involved. It aims to put in place rules and best practice on how to do business and treat customers. The key issues relate to consumers getting a fair deal and not being exploited or misled due to information asymmetry.

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| **FACTFIND**  Find out more about prudential and conduct regulators, such as those in the UK.  [Prudential Regulation Authority](https://www.bankofengland.co.uk/prudential-regulation)  [Financial Conduct Authority](https://www.fca.org.uk/)  How do they compare with the regulators in your country? |

## 4.2 Bank for International Settlements

Based in Basel, Switzerland, the BIS was created in 1930 by an agreement between:

* Belgium;
* France;
* Germany;
* Italy;
* Japan;
* the UK; and
* Switzerland.

The BIS focuses on technical co-operation between central banks and provides a forum for central bank governors and officials to meet and exchange ideas regularly. The BIS does its own research in central banking and guidance and collects statistics.

From 1947, the BIS’s main focus was on European monetary co-operation and it was involved in initiatives such as the European Payments Union, the European Monetary System and the Committee of the Governors of the Central Banks of the Member States of the European Economic Community.

Over time, the BIS’s role became increasingly global and from 1994 the membership of the BIS included all systemically important markets. The BIS is now commonly known as the central bank of central banks. Although the standards developed by the BIS are aimed at adoption by members, they are typically implemented by members and non-members.

### 4.2.1 Basel Committee on Banking Supervision

The BCBS is the main global standard setter for prudential regulations. It is part of the BIS and has 45 members from 28 countries. BCBS members are central banks and bank supervisors.

The BCBS produces policies aimed at improving stability of the financial system. The policy decisions take the form of:

* **standards**:minimum requirements for member jurisdictions;
* **guidelines**:elaborate guidance in areas important for prudential supervision; and
* **sound practices**:set of principles providing a framework to improve policies and practices.

The development of policies is not undertaken in isolation but is a collaboration between different regulators and central banks, subject to extensive consultation. The BCBS expects member countries to implement finalised standards in a timely, consistent and effective manner. However, this cannot be legally enforced because the BCBS does not have supranational authority. Generally, the process to implement the policies in local regulations is as follows.

**Figure 4.2 General process of implementing BCBS policies in local regulation**

### 4.2.2 Basel Capital Accords

The Basel Capital Accords, or Basel Accords, form one of the BCBS’s most important policies. The Latin American debt crisis of the early 1980s raised concerns that the capital international banks held was not sufficient to guarantee the stability of the financial system. In response, the BCBS devised a capital-measurement system, the Basel Accord, which was published in 1988. Although intended for implementation by G10 countries only, it was adopted by all countries with internationally active banks globally. The Basel Accord and its subsequent revisions can be summarised as follows.

**KEY TERMS**

**Banking book**

A term for assets on a bank’s balance sheet that are expected to be held to maturity, usually consisting of customer loans to and deposits from retail and corporate customers.

**Leverage**

The amount of debt a firm uses to expand its asset base and generate greater returns on its risk capital.

**Trading book**

A financial institution’s assets intended for active trading.

**Table 4.3 Basel Accords**

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| **Version and year** | **Description** |
| Basel Capital Accord: 1988 | Focused on the capital adequacy of financial institutions, it introduced a minimum ratio of capital to risk-weighted assets (RWA) of 8% (discussed in section 4.3). Initially only focusing on credit risk, it was amended in 1996 to incorporate a capital charge for market risk. |
| Basel II – the new capital framework: 2004 | Introduced three pillars with a focus on the banking book:   1. minimum capital requirement for credit, market and operational risk, allowing a range of approaches to calculate RWA depending on the sophistication of the bank’s risk management practices; 2. supervisory review process; 3. disclosure rules.   Subsequent updates incorporated the trading book. |
| Basel III: 2017 | Following the 2007–09 financial crisis, the framework was strengthened to:   * reduce leverage; * include liquidity buffers; * strengthen governance. |
| Basel III additions: 2023 | Sometimes referred to as Basel IV or Basel 3.1, a number of changes have been made for implementation in January 2023 including:   * output floor restricting the benefits of the advanced approaches to measuring RWA; * removal of more advanced approaches for certain exposure classes. |

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| **FACTFIND**  Consider the UK PRA’s [Supervisory Statement (SS) 11/13](https://www.bankofengland.co.uk/prudential-regulation/publication/2013/internal-ratings-based-approaches-ss), and find out the following.   1. When was it first issued? 2. What was the reason for its issuance? 3. What was the reason for its most recent issue? |

## 4.3 Risk-weighted assets

RWA reflect the risk of each individual exposure, to determine how much capital a financial institution needs to hold to be able to absorb any losses in the event the loan is not repaid. As we have learned, risk can be reduced by, for example, collateral and guarantees. The higher the risk for the bank, the higher the percentage of capital the bank needs to hold.

There are two approaches to determining RWA:

* **Standardised approach**: the regulator determines the percentage of RWA required for different types of exposures. For example, current accounts without an overdraft have a risk weighting of 0%, whereas overdrafts have a risk weighting of 100% and AAA-rated corporates have a risk weighting of 30%.
* **Modelled approach**: the bank develops statistical models to derive a detailed risk weight for each exposure depending on the characteristics of the client and the transaction.

**RWA**

Computed by adjusting each asset class for risk to determine a bank’s real-world exposure to potential losses. Regulators then use the risk-weighted total to calculate how much loss-absorbing capital a bank needs to sustain it through difficult markets.

FACTFIND

The BCBS provides guidance to the calculation of RWA. The standardised approach assigns standardised risk weights to individual exposures in CRE20 to CRE22. CRE20 was published in 2019, to be superseded by CRE22 effective 1 January 2023. Find out more:

[BIS: Calculation of RWA for credit risk](https://www.bis.org/basel_framework/chapter/CRE/20.htm?tldate=20191231)

**Table 4.4 Example risk weights**

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| **Asset class** | **Risk weight** | **Notes** |
| Claims on sovereigns and their central banks | 0–150% | AAA to unrated, with AAA rated as 0% and Below B- rated at 150% |
| Claims on international organisations | 0% | Includes the BIS, IMF, ECB, EU and eligible multilateral development banks, such as the World Bank Group, Inter-American Development Bank, Asian Development Bank, African Development Bank, and Islamic Development Bank |
| Claims on banks and securities firms | 20%–150% | Two available options: Option 1 and Option 2. Risk weight changes for BBB+ to BBB- and unrated banks in the two options. Some ratings change for short-term claims under Option 2. AAA to AA- rated as 20% |
| Claims on corporates | 20%–150% | AAA to unrated, with AAA-rated as 20% and Below BB- rated at 150%. BBB+ to BB- rated as 100% |
| Claims included in the regulatory retail portfolios | 75% | Includes revolving credits and lines of credit (eg credit cards and overdrafts), personal term loans (eg instalment loans, auto loans and educational loans) |
| Claims secured by residential mortgages | 35% | Includes mortgages |
| Claims secured by commercial real estate | 100% | Includes commercial property lending |
| Claims on investments in equities | 100% | Such as shares |
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| **Activity: risk weights**  Thinking about the risk of each of the below client types and loans, which risk weight would you assign – choose from 0%, 20%, 35%, 50%, or 100% (they can be used more than once). Assume no collateral or other risk mitigation. Then we will reveal the standardised RWA for each and the reason why.   |  |  | | --- | --- | | **Client/loan** | **Risk weight (%)** | | US government bond |  | | Residential mortgage |  | | Investment in shares |  | | BBB-rated corporate loan |  | | Loan to International Monetary Fund (IMF) |  | | Loan to AA-rated financial institution |  | |

### 4.3.1 Regulatory capital formula

The amount of regulatory capital a bank needs to hold is then calculated using the formula:

**Capital-to-RWA = Capital / RWA**

where capital-to-RWA is set by the regulator and is generally 8%, although it can be higher.

**Example: regulatory capital calculation**

Assuming capital-to-RWA is 8% and a bank’s RWA is US$4,500,000:

8% = Capital / US$4,500,000

So regulatory capital = 0.08 × 4,500,000 = **US$360,000**.

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| **Activity: regulatory capital**  Using the exposures and risk weights below, calculate the regulatory capital required if the capital-to-RWA is 8%.   |  |  |  |  | | --- | --- | --- | --- | | **Client/loan** | **Risk weight** | **Amount (US$)** | **RWA (US$)** | | US government bond | 0% | US$10m |  | | Residential mortgage | 35% | US$750,000 |  | | Investment in shares | 100% | US$2m |  | | BBB-rated corporate loan | 100% | US$250,000 |  | | Loan to IMF | 0% | US$1m |  | | Loan to AA-rated financial institution | 20% | US$850,000 |  | | **Total** |  |  |  | |

## 4.4 Liquidity ratios

The failure of banks during the 2007–09 financial crisis showed that many banks were unable to adequately manage and control liquidity risk. Liquidity ratios are an important financial metric used to determine a bank’s ability to cover current obligations without the need to raise more capital. To address liquidity risk, the BCBS introduced two measures:

* liquidity coverage ratio (LCR); and
* net stable funding ratio (NSFR).

**Liquidity risk**

The ability of a bank to fund increases in assets and meet obligations as they fall due without incurring unacceptable losses.

Liquidity ratios are typically short-term measures, whereas solvency ratios such as the interest coverage ratio are considered longer-term measures to assess ability to pay.

### 4.4.1 Liquidity coverage ratio

The purpose of the LCR is to enhance the short-term resilience of a bank’s liquidity profile. The aim is to ensure the bank has an adequate level of high-quality liquid assets (HQLA) that can easily be converted into cash so that the bank can meet its liquidity needs for 30 calendar days to absorb economic and financial shocks. The period of 30 days is deemed the minimum period needed for corrective action to be taken by the bank’s management or their supervisors.

The LCR is calculated as:

**HQLA / Total net cash flow**

Although the LCR is intended to be applied to internationally active banks, most countries require the LCR for all banks.

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| **FACTFIND**  What is the LCR of banks in your country? Here is an example list for banks in Europe.  Statista: [LCR of banks in Europe](https://www.statista.com/statistics/909924/liquidity-coverage-ratio-in-europe-by-country/) |

### 4.4.2 Net stable funding ratio

The NSFR complements the LCR and aims to promote resilience over a longer time horizon. This is achieved by providing incentives for banks to fund their activities with more stable sources of funding on an ongoing basis – in other words to find a sustainable balance between long- and short-term capital and liabilities. The NSFR is intended to apply to internationally active banks, although in some jurisdictions it is required for other banks as well.

The NSFR is calculated as:

**Total available stable funding (ASF) / Total required stable funding (RSF) equal to or greater than 100%**

where:

* **ASF** is the portion of a bank’s capital and liabilities that will remain with the institution for more than one year; and
* **RSF** is the amount of stable funding that an institution is required to hold given the liquidity characteristics and residual maturities of its assets and the contingent liquidity risk arising from its off-balance-sheet exposures.

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| **Reflect**  What capital is required for banks in your country? |

## Test your knowledge

1. In financial regulation, the main global standard-setting body is the:
   1. BCBS.
   2. BIS.
   3. IMF.
2. Which type of regulation focuses on ensuring the soundness of banks, as opposed to regulating their business activities?
   1. Prudential regulation.
   2. Conduct regulation.
   3. Self-regulation.
3. Which of the Basel Accords introduced three pillars with a focus on the banking book?
   1. Basel Accord.
   2. Basel II.
   3. Basel III.
4. Capital-to-RWA is set by the regulator and is generally:
   1. 6%.
   2. 7%.
   3. 8%.
5. Which liquidity ratio aims to enhance the short-term resilience of a bank’s liquidity profile?
   1. LCR.
   2. NSFR.
   3. HQLA.

## References

Bank of England (2021) *What is capital?* [online]. Available at: <https://www.bankofengland.co.uk/knowledgebank/what-is-capital>

BIS (2019) *Calculation of RWA for credit risk – CRE20: Standardised approach: individual exposures* [online]. Available at: <https://www.bis.org/basel_framework/chapter/CRE/20.htm?tldate=20191231>