# Topic 3 Risk in banking

## Learning objectives

In this topic we shall cover:

* the concept of risk;
* the relationship between risk and reward;
* different risk types in banking;
* risk categorisation;
* risk management;
* risk mitigation.

Risk is an integral part of banking, and banks earn revenue in exchange for accepting a certain amount of risk. Depending on the type of risk, the consequences of failing to manage risk adequately can be severe for banks, investors and the wider economy.

In this topic, we define and categorise the different types of risk that banks face, the relationship between risk and reward, and risk management.

## 3.1 What is risk?

Risk is commonly defined as the possibility of suffering some form of loss or damage.

**What is risk? A 30,000-foot perspective**

Watch the following video to explore a few important views on risk.

<https://youtu.be/ijLfY06br4A>

A way to think about risk in financial services is to consider the effects following a series of events, such as changes in financial market prices or economic conditions, and specific actions taken by a bank. The results of these events can be positive (upside risk) or negative (downside risk), so risk can result in both losses and gains.

When a risk is associated with a gain, it is considered an opportunity. When it is associated with a loss, it is considered a threat. Although banks recognise the upside in revenues, they tend to view risk in terms of exposure to potential loss when undertaking an activity.

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| **Reflect**How does risk occur in your daily life? What kind of risk does your bank undertake? |
| Key terms****Upside risk****An event that creates a positive outcome. This can be financial or non-financial. ****Downside risk****An event that creates a negative outcome. This can be financial or non-financial. |

### 3.1.1 Risk v uncertainty

Risk and uncertainty are related but are not the same.

* **Risk** is where there are a number of possible outcomes and the probability of each is known or can be measured. In other words, risk represents the variability of possible outcomes.
* **Uncertainty** also has multiple possible outcomes, but the probability of each outcome is unknown.

It is possible to measure risk. In some cases it can be quantified using statistical methods such as value at risk or standard deviation. In other cases it is more difficult to quantify. For example, the maximum amount of loss on a loan can be calculated with a high degree of accuracy. The potential loss due to a loss of reputation is not as easy to quantify.

Level of risk is affected by volatility, which is the likelihood of sudden change. The higher the volatility of possible outcomes, the higher the risk.

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| ****Volatility****The degree of variation within a dataset. For example, a dataset with values of 2, 3, 2, 4, 3, 2, 4, 3, 4, 2 shows less variation than a dataset of 3, 9, 6, 3, 6, 1, 10, 4, 8, 20, so it is therefore less volatile. |

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| **Activity: risk comparison**The share price for companies A and B are shown below. Based on this pattern, which one is a higher risk?**Figure 3.1 Example share prices**  |

## 3.2 Types of risk in financial services

Financial institutions are subject to a range of risks, many of which are explained in this section. This list of risks is not exhaustive.

### 3.2.1 Credit risk

Credit risk is the possibility of a loss from a borrower not repaying all or part of their loan and/or interest payments. Credit risk can be assessed using the 5 Cs.

* **C**haracter – credit history of the borrower. Do they have a history of repaying loans or are they behind on some payments? Banks can use internal information on borrower behaviour as well as credit reports from credit bureaus and rating agencies.
* **C**apacity – is the borrower’s income sufficient to repay all the loans the borrower has? Income can be salary for retail borrowers, or projected revenue for corporate customers.
* **C**apital – does the borrower also have their own capital invested? Examples include private equity in a corporate venture or a deposit on a mortgage. When a borrower also invests their own funds, they are more likely to repay the loan.
* **C**ollateral – does the borrower have any assets that can be pledged to the loan? If the borrower does not repay, the bank can liquidate the collateral and use the proceeds towards repayment of the loan.
* **C**onditions of the loan – purpose, amount and interest.

These criteria assess the ability to pay through qualitative (ie describing qualities) and quantitative (ie quantifiable) measures. The first criterion, character, also assesses willingness to pay.

If a borrower does not repay all or part of the principal and interest, the bank faces additional costs to collect the funds and will not be able to lend the funds to other borrowers.

### 3.2.2 Market risk

Market risk is the risk of loss due to adverse changes in prices. It is also known as systematic risk and affects the whole market. Specific or unsystematic risk, in contrast, is the risk of adverse price movements of a single security. This risk can be mitigated by diversifying. Causes of market risk are changes in interest rates, exchange rate movements, geopolitical events and recessions.

Because it affects the overall performance of financial markets, market risk cannot be diversified. There are, however, ways to mitigate market risk, such as hedging of certain exposures (discussed in section 3.4.2).

One of the most used measurements of market risk is value at risk (VaR). This method attempts to measure the downside risk of a portfolio, a group of portfolios or the whole firm in a single number representing the maximum amount a bank is likely to lose on a given day or over a number of days with a high level of confidence (95% or 99%).

However, this does not mean the bank cannot lose more; it means the probability that it will lose more is very small.

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| **Check your understanding**A bank has a VaR of $75m with a 95% level of confidence over a 10-day period. What does this mean?  |

### 3.2.3 Operational risk

Operational risk is the risk of losses due to inadequate or failures of internal processes, people and systems, or from external events. It includes legal risk but excludes strategic and reputational risk. In this context, legal risk includes the risk of fines and penalties resulting from supervisory actions and private settlements.

Operational risk for banks can be divided in the following event types (BIS, 2020):

* **Internal fraud** – misappropriation of assets, circumvention of laws and regulations or company policy, market manipulation.
* **External fraud** – acts intended to defraud by a third party such as theft of information, computer hacking and other cyber-related crimes, and forgery.
* **Employment practices and workplace safety** – acts inconsistent with employment, violation of health and safety rules, workers’ compensation and discrimination claims.
* **Clients, products and business practices** – unintentional or negligent failure to meet a professional obligation, inappropriate transactions, product defects, misuse of confidential information, and money laundering.
* **Damage to physical assets** – loss or damage to physical assets from natural disasters or other events.
* **Business disruption and system failures** – hardware, software and technical infrastructure failures, utility disruptions, problems with real estate facilities.
* **Execution, delivery and process management** – failed transaction processing.

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| **FACTFIND**Find out more about the top three risks in banking from the latest Banking Banana Skins report.CSFI: [Banking Banana Skins](https://www.csfi.org/banking-banana-skins) |

Operational risk is most commonly measured by ranking the risks in terms of likelihood of the event occurring and the possible impact. We consider risk impact assessment further in section 3.4.1.

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| **Activity: prioritising risk events**If we put operational risk events in a bank into the following broad categories, which one would need to be monitored most closely?* High occurrence, low impact.
* Medium occurrence, medium impact.
* Low occurrence, high impact.

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### 3.2.4 Reputational risk

Reputational risk is the risk of a negative impact on the reputation or good standing of a business. In financial services, trust, and therefore reputation, of an institution is vital. Anything that negatively affects reputation may result in loss of clients, higher cost of capital or inability to access financial markets.

Reputational risk occurs in three main ways:

* **directly** due to the actions of the organisation;
* **indirectly** due to the actions of current or past employees;
* **tangentially** through other parties the institution is associated with, such as suppliers, agencies or brokers.

Reputational risk can arise quickly and seemingly out of nowhere. The impact of reputational risk can be extremely high and take a long time to recover from. Monitoring online reviews and social media interactions, ensuring employee satisfaction and responding quickly to possible issues are crucial in managing reputational risk.

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| **FACTFIND**Wells Fargo agreed to pay $3bn to settle criminal charges and a civil action in relation to mistreatment of customers. Find out what happened and what the bank has done in response.Forbes: [Wells Fargo’s mea culpa: how to lead change after a scandal](https://www.forbes.com/sites/jasonwingard/2019/11/01/wells-fargos-mea-culpa-how-to-lead-change-after-a-scandal/?sh=4b4a1db35b74) |

### 3.2.5 Liquidity risk

Liquidity is the ability of a bank to fund increases in assets and meet obligations as they fall due without incurring unacceptable losses. In other words, it is a measure of how quick and easy an asset (for example an equity or a bond) can be converted into cash without an impact on the market price.

The intermediary role of banks, in which they accept short-term deposits and transform them into long-term loans, makes banks vulnerable to liquidity risk. For example, if all depositors want to withdraw their deposits at the same time, does the bank have ways to honour those commitments without having to request long-term borrowers to repay? Therefore, banks need to hold assets that can easily be converted into cash to meet obligations.

Although liquidity risk is managed by individual banks, a shortfall in liquidity by one bank has an impact on other parts of the financial system.

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| **FACTFIND**In 1974 Herstatt Bank did not pay the US$ it owed to counterparties. Find out what happened next. Is this different from or similar to the collapse of Bear Stearns?Bank Underground: [BoE archives reveal little known lesson from the 1974 failure of Herstatt Bank](https://bankunderground.co.uk/2015/06/24/boe-archives-reveal-little-known-lesson-from-the-1974-failure-of-herstatt-bank/) |

One of the most basic ways to measure an asset’s liquidity is to consider the difference between the:

* price at which an asset is offered to be bought; and
* price at which it is offered to be sold.

This is the bid–ask spread, and the wider the spread, the lower the liquidity of the asset. The bid–ask spread represents the number of buyers and sellers in the market and the type and size of the security.

**Example: bid–ask spread**

Selling 100 shares in a company with a total number of outstanding shares of 1,000,000 is unlikely to have an impact on the market price. However, if the total number of outstanding shares is 500 there is likely to be an impact on the price.

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| **FACTFIND**Investigate online the circumstances surrounding the Northern Rock failure and the role of liquidity. The following offers a summary.BBC News: [The collapse of Northern Rock: ten years on](https://www.bbc.com/news/business-41229513) |

### 3.2.6 Regulatory risk

Regulatory risk is the risk that a change in regulations has a negative impact on the business. In financial services this could, for example, occur because the regulations require a bank to hold more capital, which will negatively impact the bank’s ability to do business and generate profits.

In addition, there is the risk that a bank has interpreted a regulation in a way the regulator does not agree with, or where the regulator initially agrees but changes their position. This is generally managed by maintaining an open and transparent relationship with the institution’s regulator(s) – international financial organisations will have more than one regulator.

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| **Reflect**Standard Chartered is a UK-based multinational bank with retail operations across the world, including in African countries. If the anti-money-laundering rules are less strict in a certain country than in the UK, which rules will Standard Chartered have to follow for its retail operations in this other country? |

## 3.3 Risk appetite and tolerance

Risk management in financial institutions starts with the board of directors defining risk appetite. This identifies the level of risk the institution as a whole is willing to take or, more precisely, the amount of risk that a bank’s stakeholders wish it to take. It is the board’s responsibility to set strategies, policies and limits that accurately reflect the risk appetite of shareholders and other stakeholders, such as regulators.

Risk tolerance is the amount of risk that a bank can tolerate, or the bank’s financial capacity to absorb risk.

### What does risk appetite affect?

The risk appetite of a financial institution informs the:

* products offered;
* client base; and
* type of business the bank will enter into.

A bank’s risk appetite is reflected in:

* its capital structure (the balance between debt and equity and the composition of debt, eg the sources of the debt and what the maturities are) and funding strategy;
* its appetite for writing loans to different categories of borrowers;
* its approach to mergers, acquisitions and expansion;
* the risk limits it puts in place for trading and non-trading activities;
* qualitative (the chair’s statements and commentary) and quantitative (financial data) statements made by the bank in its risk reporting;
* how much it is scrutinised by regulators; and
* the nature of its investors.

The board may choose to allocate more or less capital to various departments depending on the risk appetite for different types of transactions.

**IN BRIEF: Risk culture**

Managing the risk appetite and risk culture of a bank is critical to a bank’s risk management strategy. If the culture of a bank is skewed towards risk taking, this could result in excessive risk taking that exceeds the bank’s risk appetite and tolerance (ie how much risk it can withstand).

## 3.4 Managing risk

Risk management is the process of identifying, analysing, accepting or mitigating, and monitoring risks observed in financial transactions.

## Key terms

**Risk averse**

Risk is not actively sought and there is a willingness to pay to reduce or remove risks, such as by purchasing insurance.

**Risk neutral**

There is an indifference towards risk or uncertainty, provided a ‘fair’ reward is received in return for taking the risk. The greater the risk, the greater the expected return.

**Risk preferring**

There is a pleasure in taking risks. For example, gamblers enjoy taking risks even if ‘the odds’ do not favour them.

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| FACTFINDHow averse to risk are you? Find out more.Harvard Business Review: [What’s your risk attitude? (And how does it affect your company?)](https://hbr.org/2012/06/whats-your-risk-attitude-and-h)  |

Risk and return are closely related. The higher the risk, the higher the potential gains or losses. When a financial institution takes more risk, it is required to hold more capital to be able to cover the potential losses. Risk is not static but changes over time for a range of reasons.

**Example: risk changing over time**

For corporates, risk may change due to mergers and acquisitions, or as a result of strategic redirection.

For individuals, risk changes following a divorce, marriage or other life changes.

### 3.4.1 Identifying and analysing risk

The identification of risk starts with an assessment of the causes of risk within the institution. For each high-level risk category, specific instances can be identified. For example, IT failure or inability to access a building are subsections of operational risk and can be further refined. In cases of IT failure, one printer not working is a very small issue, whereas the whole IT system not working is a much higher-risk issue.

A risk impact assessment is often used to analyse the relative risk of an individual event. It shows the interaction between frequency (ie likelihood) and severity (ie impact).

The risk of an individual event = likelihood x impact.

**Table 3.1 Example risk impact assessment scales**

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| **Likelihood of the event occurring** |
| Ranking | Likelihood |
| 1 | Less than 1% |
| 2 | 1%–10% |
| 3 | 10%–20% |
| 4 | 20%–50% |
| 5 | More than 50% |

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| **Estimated impact of the event** |
| Ranking | Impact |
| 1 | Less than 1m |
| 2 | 1–5m |
| 3 | 5–10m |
| 4 | 10–20m |
| 5 | More than 20m |

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| Key terms**Frequency**Also known as probability: the number of times we expect an event to happen.**Severity**Also known as impact: the effect a risk would have it if did happen. |

Once risk is accurately identified, it can be measured:

* using statistical concepts such as probability, averages or VaR; and
* considering subjective elements such as character or the impact of an imminent strategic change.

### Uncertainty cannot be predicted

The frequency and severity of risky events (such as the chance of winning a lottery jackpot) can be calculated, but the frequency and severity of uncertainty (such as the impact of an alien landing) cannot. Uncertainty, therefore, implies an inability to predict because the frequency and severity of an event cannot be established.

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| **Reflect**How worried should you be?* Consider how worried you should be about being caught up in a nuclear power plant explosion.
* TSB in the UK experienced a bank-wide IT failure in 2018 due to which customers could not make payments or access their funds. How worried should you be about something like this happening?

Keep in mind frequency versus severity. |

### 3.4.2 Accepting and mitigating risk

Risk mitigation is a technique used by financial institutions to reduce the risk they are exposed to, ensuring their risk remains within the limitations of their risk appetite. Ways to mitigate risk include the following.

* **Collateral** –requesting collateral to secure a loan. If the client does not repay all or part of the loan, the bank may seize the collateral and sell it in the open market to recover the principal and interest.
* **Hedging** –entering into a transaction that, due to its characteristics, offsets some or all of the risk associated with another transaction or group of transactions. Hedging can be undertaken by using derivatives and is often used to reduce the risk on a pool of investments.
* **Correlation** –statistical relationship between different variables, indicating the extent to which they are related. Commonly used to determine the correlation between a loan and its collateral, it assesses the extent to which the value of one asset will move in the same direction and in the same proportion as another. Positively correlated assets or events move in the same direction, whereas negatively related assets or events move in opposite directions. It can also be applied to balance portfolios.
* **Netting** –offsetting amounts payable and receivable so that only the net amount is to be paid, thus reducing settlement risk.
* **Insurance** –paying a premium to receive apayout in the event of a predefined emergency. Often used in project finance or leasing, and for the bank’s own operations.
* **Asset allocation** –identification of the proportion of assets allocated to a specific portfolio.

**Portfolio**

Collection of financial investments including shares, bonds, commodities, cash and cash equivalents either belonging to an individual or managed by a bank department.

Not all risks need to be mitigated. In cases where the cost of mitigation is higher than the potential loss, or the potential loss is very small, a bank may decide to accept the fact that this risk exists. This is called accepting the risk.

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| **Check your understanding**How are cold weather and ice-cream sales from an outdoor ice-cream seller related?1. Weakly negatively correlated.
2. Strongly negatively correlated.
3. Strongly positively correlated.
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### 3.4.3 Monitoring risk

Identifying the risks is not sufficient in itself. The environment is subject to continuous change and the risk a bank faces will change over time. Risk management includes monitoring internal and external factors to ensure any changes in the risks to which the bank is exposed are managed and that, if necessary, corrective action is taken.

## Test your knowledge

1. Whether the borrower’s income is sufficient to repay all their loans relates to which of the 5 Cs?
	1. Character.
	2. Capacity.
	3. Capital.
	4. Collateral.
	5. Conditions of the loan.
2. When reputational risk arises due to the actions of current or past employees, this is:
	1. direct.
	2. indirect.
	3. tangential.
3. Risk is not static but changes over time for a range of reasons. True or false?
4. In risk impact assessment, frequency is also known as:
	1. probability.
	2. severity.
	3. impact.
5. Which method attempts to measure the downside risk of a portfolio, a group of portfolios or the whole firm in a single number?
	1. Correlation.
	2. Standard deviation.
	3. VaR.

## Reference

BIS (2020) *OPE25 – standardised approach* [online]. Available at: <https://www.bis.org/basel_framework/chapter/OPE/25.htm?inforce=20230101&published=20200605> [Accessed: 12 August 2021].