LM14 · FIXED INCOME · CFA LEVEL I

# Credit Risk

The 5 Cs (bottom-up) and 3 Cs (top-down) of credit, expected loss, credit spreads, and rating-agency practices.

### Learning Outcomes

**LOS a** Describe credit risk and its components

**LOS b** Describe credit spreads, ratings, and key drivers of credit spreads

**Exam Tip:** Expected loss = PD × LGD × exposure. Know the 5 Cs (Capacity, Capital, Collateral, Covenants, Character) and the 3 Cs (Conditions, Country, Currency).

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LOS A · COMPONENTS OF CREDIT RISK

## Credit Risk Components

- **Default risk / probability of default (PD)** — probability that the issuer fails to pay interest or principal on time.
- **Loss severity / loss given default (LGD)** — one minus the recovery rate; the loss if default occurs.
- **Expected exposure** / exposure at default — amount owed minus the value of collateral available.
- **Recovery rate** — proportion of the claim recovered on default.

$$Expected loss = PD \times LGD = PD \times (1 - recovery rate) \times exposure Loss severity = 1 - re$$

**Illiquid vs. insolvent:** an illiquid issuer cannot raise cash to service debt but may still be solvent. An insolvent issuer has assets worth less than liabilities. Illiquid firms can still default.

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LOS A · BOTTOM-UP FACTORS

## 5 Cs of Credit Analysis (Bottom-Up)

1. **Capacity** — the borrower's ability to make debt payments on time. Measured through leverage and coverage ratios.
2. **Capital** — other resources available, reducing reliance on debt.
3. **Collateral** — value of assets pledged to secure the debt.
4. **Covenants** — legal terms and conditions agreed in the bond indenture.
5. **Character** — integrity of borrower's management and commitment to honoring debt.

LOS A · TOP-DOWN FACTORS

## 3 Cs of Credit Analysis (Top-Down)

- **Conditions** — macro environment affecting all borrowers' ability to service debt.
- **Country** — geopolitical, legal, and political environment.
- **Currency** — FX fluctuations and their effect on foreign-denominated debt.

> Top-down factors are macro, bottom-up factors are firm-specific. Both matter to credit analysts.

CHECKPOINT 1

## Quiz 1: Credit Components

Answer all questions to test your understanding. Your score updates on the final step.

**Q1.** Expected loss on a bond is calculated as:

**Q2.** The 5 Cs of **bottom-up** credit analysis include:

**Q3.** An issuer that is **illiquid but solvent** can still:

**Q4.** Recovery rate of 40% implies loss severity of:

**Q5.** A cross-default clause means that a default on one bond:

LOS B · CREDIT RATINGS

# Credit Ratings

Credit-rating agencies (S&P, Moody's, Fitch) assign forward-looking ratings to issuers and debt issues based on qualitative and quantitative credit risk factors.

| GRADE | MOODY'S | S&P / FITCH |
|---|---|---|
| Investment grade (upper) | Aaa — A3 | AAA — A– |
| Investment grade (lower) | Baa1 — Baa3 | BBB+ — **BBB–** |
| Non-investment grade / high yield | Ba1 — C | **BB+** — C |
| In default | — | D |

### Limitations of credit ratings

- Credit ratings can be very **dynamic**.
- Rating agencies are **not foolproof**.
- Idiosyncratic / event risks (natural disasters, buybacks, M&A) are difficult to capture.
- Ratings tend to **lag** market pricing of credit.

LOS B · DRIVERS OF CREDIT SPREADS

# Credit Spreads & Their Drivers

The **credit spread** is the yield differential between a bond and a risk-free benchmark of the same maturity.

### Macro & issuer-specific drivers

- **Credit cycle:** spreads narrow at the top, widen at the bottom.
- **Broader economic conditions:** widen in weak economies, narrow in strong.
- **Funding availability:** dealer balance sheets and financing costs.
- **Supply and demand:** heavy new issuance → wider spreads; strong demand → narrower.
- **Financial performance of issuer:** deteriorating fundamentals → wider spread.
- **Market liquidity risk:** wider bid-offer → higher liquidity risk → wider spread.

### High-yield vs. investment-grade credit curves

- Spreads usually *increase with maturity* → upward-sloping credit curves.
- In contractions: IG & HY credit curves rise and **flatten**; HY curve may even **invert**.
- In expansions: IG & HY curves fall and **steepen**. Credit curves are lowest and steepest at the peak.
- HY spreads fluctuate more than IG spreads.

CHECKPOINT 2

# Quiz 2: Ratings & Spreads

Answer all questions to test your understanding. Your score updates on the final step.

**Q6.** The boundary between investment grade and high yield on the S&P scale is:

**Q7.** A deteriorating credit cycle *most likely* causes credit spreads to:

**Q8.** A wider **bid-offer spread** indicates higher:

**Q9.** During a deep recession, the high-yield credit curve is most likely to:

**Q10.** Credit ratings *most accurately*:

LOS B · SPREAD FORMULATION

# Estimating Fair Credit Spread

The fair credit spread compensates for expected loss per period:

$$Fair credit spread \approx PD \times LGD$$

If the **actual** credit spread on a bond exceeds this estimate, investors are **more than fairly compensated**. If the actual spread is below this estimate, compensation is inadequate and the investor should pass.

Investment-grade issuers have lower PD. However, because high-yield issuers often issue *secured* debt, HY bonds can have lower LGD than unsecured IG debt — so a first-lien high-yield note may carry less expected loss than it seems.

CHECKPOINT 3 · SYNTHESIS

# Quiz 3: Synthesis

Answer all questions to test your understanding. Your score updates on the final step.

**Q11.** A bond with PD = 2% and LGD = 45% has expected loss of:

**Q12.** Which of the three "C's" refers to the *macro* business cycle?

**Q13.** A **flight to quality** refers to investors:

**Q14.** A BBB–-rated bond is:

**Q15.** If the actual credit spread on a bond is **lower** than PD × LGD, investors are:

MODULE COMPLETE

## Your Scorecard

# 0 / 15

## LM14 Key Takeaways — Exam-Ready Cheat Sheet

### Credit math

$$Expectedloss = PD \times LGD \times exposureLossseverity = 1 - recoveryrateFaircreditsp$$

### The Cs

**Bottom-up (5):** Capacity, Capital, Collateral, Covenants, Character. **Top-down (3):** Conditions, Country, Currency.

### Spreads

Widen in weak economies, near credit cycle troughs. In contractions, curves flatten; HY may invert. Empirical duration helps when spread and benchmark yield correlate.

### Ratings

IG: AAA – BBB– (Baa3). HY: BB+ (Ba1) and below. Ratings **lag** market pricing and miss event risk.

Step 1 of 11