LEVEL 1: FIXED INCOME

Reading 44 (6th out of 6): CREDIT ANALYSIS

Difficulty: **medium**

Benchmark Study Time: **5.2h**

2022

THIS E-BOOK:

- is a selective summary of the corresponding Reading in your CFA® Program Curriculum,
- provides place for your own notes,
- helps you structure your study and revision time!

How to use this e-book to maximize your knowledge retention:

1. **Print** the e-book in duplex and bind it to keep all important info for this Reading **in one place.**
2. **Read** this e-book, best twice, to grasp the idea of what this Reading is about.
3. **Study** the Reading from your curriculum. **Here add** your notes, examples, formulas, definitions, etc.
4. **Review** the Reading using this e-book, e.g. write your summary of key concepts or revise the formulas at the end of this e-book (if applicable).
5. **Done?** Go to your study plan and change the Reading's status to **green**:
   (it will make your Chance-to-Pass-Score™ grow ☺).
6. **Come back** to this e-book from time to time to **regularly review for knowledge retention!**

NOTE: While studying or reviewing this Reading, you can use the tables at the end of this e-book and mark your study/review sessions to hold yourself accountable.

CREDIT RISK

credit risk = the risk of incurring a loss as a result of the issuer not being able to make full and timely payments of interest and/or principal.

Components of credit risk

$$\text{expected loss} = \text{default probability} \times \text{loss severity (given default)}$$

There are 2 components of credit risk:

- default probability (aka. default risk),
- loss severity (aka. loss given default).

default probability = the probability that the issuer will default (won't be able to repay the scheduled amounts); the higher the default risk, the greater the probability that investors will lose some or all of the money invested.

loss severity = how large the loss of investors (in %) will be in case of default; loss severity is equal to 1 less the recovery rate.

Usually, different bond classes holders are subject to different amounts of credit risk.

Credit-related risks

The yield-to-maturity of an option-free corporate bond can be presented as the sum of a government benchmark yield and a spread over the benchmark.

The size of the spread (given in basis points) depends on the **spread risk**.

Spread risk consists of 2 risks:

- **credit migration risk** (aka. downgrade risk) (the lower the issuer's creditworthiness, the higher the risk),
- **market liquidity risk**.

Where market liquidity risk depends on 2 factors:

- the amount of outstanding publicly traded debt of the company (the lower the amount, the higher the risk),
- the credit quality of the issuer (the lower the quality, the higher the risk).

HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

SENIORITY RANKINGS & PRIORITY OF CLAIMS

The capital structure of a company consists of:

- common equity,
- preferred stock,
- bank debt,
- bonds with different seniority rankings.

The capital and corporate structure can be less or more complex, e.g. a company might not have or might have subsidiaries that issue debt, might operate in the international market, etc.

If we take priority of payment (aka. **seniority ranking**) into account, we can distinguish among different classes of debt (starting with the highest priority of claims):

- **secured debt** (= with a direct claim to the issuer's assets in case of default or restructuring):
    a. first lien loan (senior secured),
    b. second lien loan (secured), etc.
- **unsecured debt** (debenture):
    a. senior unsecured,
    b. senior subordinated,
    c. subordinated,
    d. junior subordinated.

The lower the priority of claims of a given creditor class, the lower the recovery in case of default.

pari passu = a provision according to which all bonds in a given creditor class are treated the same

According to the **absolute priority of claims**, in case of bankruptcy, holders of secured debt get paid out first → then, holders of unsecured debt → then, preferred stock holders → and, finally, common equity holders.

In practice, however, not always do secured creditors get paid out in full before the rest, e.g.:

During the reorganization process, there might arise some disputes regarding, for example, the value of the company's assets. Because all parties have to agree to the reorganization plan, to save time and money secured creditors might agree not to get paid out in full (or the judge might decide so). As a result of this decision, subordinate creditors and shareholders receive more consideration than they were initially entitled to.

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RATING AGENCIES

Rating agencies give credit ratings to issuers and issues. Investors use these credit ratings in the investment decision process when they analyze the risk of investments.

The most important rating agencies:

- Moody's Investor Service (aka. Moody's),
- Standard & Poor's (aka. S&P),
- Fitch Ratings (aka. Fitch).

Examples of long-term ratings:

Moody's	Aa2	Baa1	B3	Ca
S&P	AA	BBB+	B-	CC
Fitch	AA	BBB+	B-	CC

Please note that for long-term ratings:

- both S&P and Fitch use exactly the same symbols.
- the highest possible rating is **Aaa** for Moody's and **AAA** for S&P and Fitch.
- the lowest possible rating (issue in default) is **C** for Moody's and **D** for S&P and Fitch.
- all agencies usually provide outlooks for the future: positive, stable, or negative.

Investment bonds vs Junk bonds

We define investment grade bonds as bonds that meet the following condition:

- **Moody's:** Baa3 or higher
- **S&P:** BBB- or higher
- **Fitch:** BBB- or higher

We define non-investment grade bonds (aka. junk bonds, yield bonds) as bonds that meet the following condition:

- **Moody's:** Ba1 or lower
- **S&P:** BB+ or lower
- **Fitch:** BB+ or lower

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Issuer credit rating vs Issue credit rating

The **issue credit rating** (aka. CCR = corporate credit rating) doesn't have to be exactly the same as the **issuer credit rating** (aka. CFR = corporate family rating). The issuer credit rating usually applies to the issuer's senior unsecured debt, whereas the issue credit rating depends on the terms like the priority of payments, etc. for a given issue.

We use the term ***notching*** to describe the process of adjusting the issue credit rating to reflect the credit risk of the issue.

Risks in relying on credit ratings

The limitations of credit ratings:

1. Credit ratings can change over time.
2. Credit ratings are usually lagging indicators of how the market assesses the credit risk.
3. It might be hard or impossible for rating agencies analysts to predict and capture all the risks related to a particular issuer/issue.
4. Credit rating agencies analysts might make mistakes.

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Four Cs of Credit Analysis

capacity = the ability of the issuer to make debt payments according to the payment schedule

To analyze the capacity of the issuer to service its debt, the credit analysts use the following process:

1. Analyzing industry structure (e.g. using Porter five forces).
2. Analyzing industry fundamentals (e.g. growth prospects, cyclical vs non-cyclical, etc.).
3. Analyzing company fundamentals (e.g. competitive position, operating history, management's strategy and execution, ratio analysis, etc.)

collateral = the quality and value of the assets that serve as collateral for the issued debt

Assets of a company vary in value, e.g. intangible assets like goodwill should be perceived as assets of lower quality. What is more, for publicly traded companies, if the market value is below the book value, it should be perceived as a warning sign.

covenants = terms and conditions of lending agreements, introduced to protect creditors, that the borrower has to comply with

There are negative covenants (= what the issuer cannot do) and affirmative covenants (= what the issuer must do).

character = quality of the issuer's management

Both current and historical data about management should be taken into account. Warning signs: aggressive accounting policy, poor behavior towards bondholders, bad historical management track record, any history of fraud, etc.

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FINANCIAL RATIOS USED IN CREDIT ANALYSIS

Leverage ratios

$$\text{debt/capital} = \frac{\text{debt}}{\text{debt} + \text{shareholders equity}}$$

$$\frac{\text{debt}}{\text{EBITDA}}$$

$$\text{FFO/debt} = \frac{\begin{matrix}(\text{net income from continuing operations} + \text{depreciation} + \text{amortization} + \\ + \text{deferred income from taxes} + \text{other non-cash items})\end{matrix}}{\text{debt}}$$

$$\text{FCF after dividends/debt} = \frac{\begin{matrix}(\text{net income from continuing operations} + \text{depreciation} + \text{amortization} - \\ - \text{change in non-cash working capital} - \text{capital expenditures}) - \text{dividends}\end{matrix}}{\text{debt}}$$

Note: FFO stands for funds from operations; FCF stands for free cash flow

Coverage ratios

$$\text{EBITDA interest coverage} = \frac{\text{EBITDA}}{\text{interest expense}}$$

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Credit quality of issuer/bond in comparison to industry

In your exam, you might be asked to compare the credit quality of a company in comparison to the industry using different ratios. To do this right, always pay attention to the form of a given ratio, i.e. **what's in the numerator and what's in the denominator**.

- **For debt ratios:**
  a. if debt is given in the numerator of the ratio, then the higher the ratio, the lower the credit quality. A higher debt ratio means that the proportion of debt in relation to the other value (given in the denominator) is higher. The more debt outstanding the company has, the more credit risk there is.
  b. if debt is given in the denominator of the ratio, then the higher the ratio, the higher the credit quality.
- **For coverage ratios, the higher the ratio, the higher the credit quality.** It's because coverage ratios are usually given as some profit/cash flow value, e.g. EBITDA, CFO, etc. divided by debt service. So, a higher coverage ratio means that it's easier for the company to cover its obligations related to outstanding debt, i.e. pay interest. The easier it is for the company to pay interest, the higher the credit quality.

HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

VOLATILITY OF YIELD SPREADS

yield-to-maturity on a corporate bond = government benchmark yield + spread over the benchmark

Where:

government benchmark yield = real risk-free interest rate + expected inflation + maturity premium

spread over the benchmark = credit spread + liquidity premium

Factors that impact the level and volatility of yield spreads:

- credit cycle: when the credit cycle improves → narrower spreads
- broader economic conditions: market improves → narrower spreads
- financial market performance: better overall performance → narrower spreads
- broker-dealers' willingness to provide liquidity in the market: more liquidity → lower liquidity premium → → narrower spreads
- bond market supply and demand: in case of excess supply → wider spreads

Note that the spreads for higher quality bonds are less volatile and change less as a result of the above-mentioned factors.

If we want to quantify the impact of the change in a spread on the bond price, we can use modified duration and convexity statistics:

$$\textbf{Price change}\ (\%) = -\textbf{ModD} \times (\textbf{spread change}) + 0.5 \times \textbf{Convexity} \times (\textbf{spread change})^2$$

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DIFFERENT BONDS – DIFFERENT CONSIDERATIONS

When conducting a **non-investment bond analysis**:

- focus on the issuer's liquidity and cash flows,
- prepare detailed financial projections,
- analyze debt covenants thoroughly,
- pay special attention to the corporate structure, capital structure, and debt structure,
- apply the equity-like approach.

When conducting a **sovereign bond analysis** focus on:

- political risks of the country, its economic structure, and growth prospects,
- external liquidity and international investment position,
- fiscal policy performance and institutional effectiveness,
- flexibility and independence of the central bank (monetary policy).

When doing a **non-sovereign bond analysis**:

- if dealing with **general obligation (GO) bonds**, focus on employment rate, per capita income, per capita debt, demographics, the tax base, volatility of revenues, etc.
- if dealing with **revenue bonds** (used to finance specific projects), focus on financial aspects of the investment financed, its expected revenues, cash flows, costs, liquidity, etc.

HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

Summarizing key concepts:

☐ Credit risk & Credit-related risks

My summary:

☐ Seniority rankings & Priority of claims

My summary:

☐ Rating agencies

My summary:

☐ Issuer credit rating vs Issue credit rating

My summary:

☐ Four Cs of credit analysis

My summary:

☐ Financial ratios used in credit analysis

My summary:

☐ Volatility of yield spreads

My summary:

☐ Different bonds → Different considerations

My summary:

Reviewing formulas:

$$\text{expected loss} = \text{default probability} \times \text{loss severity (given default)}$$

Write down the formula:

$$\text{debt/capital} = \frac{\text{debt}}{\text{debt} + \text{shareholders equity}}$$

Write down the formula:

$$\text{FFO/debt} = \frac{\begin{array}{c}(\text{net income from continuing operations} + \text{depreciation} + \text{amortization} + \\ +\text{deferred income from taxes} + \text{other non-cash items})\end{array}}{\text{debt}}$$

Write down the formula:

$$\text{FCF after dividends/debt} = \frac{\begin{array}{c}(\text{net income from continuing operations} + \text{depreciation} + \text{amortization} - \\ - \text{change in non-cash working capital} - \text{capital expenditures}) - \text{dividends}\end{array}}{\text{debt}}$$

Write down the formula:

yield-to-maturity on a corporate bond = government benchmark yield + spread over the benchmark

Write down the formula:

$$\text{Price change (\%)} = -\text{ModD} \times (\text{spread change}) + 0.5 \times \text{Convexity} \times (\text{spread change})^2$$

Write down the formula:

Keeping myself accountable:

TABLE 1 | STUDY

When you sit down to study, you may want to **try the Pomodoro Technique** to handle your study sessions: study for 25 minutes, then take a 5-minute break. Repeat this 25+5 study-break sequence all throughout your daily study session.

✓ Tick off as you proceed.

POMODORO TIMETABLE: study-break sequences (25' + 5')													
date		date		date		date		date		date		date	
25'		25'		25'		25'		25'		25'		25'	
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25'		25'		25'		25'		25'		25'		25'	
5'		5'		5'		5'		5'		5'		5'	

TABLE 2 | REVIEW

Never ever neglect revision! Though it's not the most popular thing among CFA candidates, regular revision is what makes the difference. If you want to pass your exam, **schedule & do your review sessions.**

REVIEW TIMETABLE: When did I review this Reading?													
date		date		date		date		date		date		date	
date		date		date		date		date		date		date	