CHAPTER 6

FUNDAMENTALS OF CREDIT ANALYSIS

LEARNING OUTCOMES

After completing this chapter, you will be able to do the following:

- describe credit risk and credit-related risks affecting corporate bonds;
- describe default probability and loss severity as components of credit risk;
- describe seniority rankings of corporate debt and explain the potential violation of the priority of claims in a bankruptcy proceeding;
- distinguish between corporate issuer credit ratings and issue credit ratings and describe the rating agency practice of "notching";
- explain risks in relying on ratings from credit rating agencies;
- explain the four Cs (Capacity, Collateral, Covenants, and Character) of traditional credit analysis;
- calculate and interpret financial ratios used in credit analysis;
- evaluate the credit quality of a corporate bond issuer and a bond of that issuer, given key financial ratios of the issuer and the industry;
- describe factors that influence the level and volatility of yield spreads;
- explain special considerations when evaluating the credit of high yield, sovereign, and non-sovereign government debt issuers and issues.

SUMMARY OVERVIEW

In this chapter, we introduced readers to the basic principles of credit analysis. We described the importance of the credit markets and credit and credit-related risks. We discussed the role and importance of credit ratings and the methodology associated with assigning ratings, as well as the risks of relying on credit ratings. The chapter covered the key components of credit analysis and the financial measure used to help assess creditworthiness.

We also discussed risk versus return when investing in credit and how spread changes affect holding period returns. In addition, we addressed the special considerations to take

into account when doing credit analysis of high-yield companies, sovereign borrowers, and non-sovereign government bonds.

- Credit risk is the risk of loss resulting from the borrower failing to make full and timely payments of interest and/or principal.
- The key components of credit risk are risk of default and loss severity in the event of default. The product of the two is expected loss. Investors in higher-quality bonds tend not to focus on loss severity because default risk for those securities is low.
- Loss severity equals (1 – Recovery rate).
- Credit-related risks include downgrade risk (also called credit migration risk) and market liquidity risk. Either of these can cause yield spreads—yield premiums—to rise and bond prices to fall.
- Downgrade risk refers to a decline in an issuer's creditworthiness. Downgrades will cause its bonds to trade with wider yield spreads and thus lower prices.
- Market liquidity risk refers to a widening of the bid–ask spread on an issuer's bonds. Lower-quality bonds tend to have greater market liquidity risk than higher-quality bonds, and during times of market or financial stress, market liquidity risk rises.
- The composition of an issuer's debt and equity is referred to as its "capital structure." Debt ranks ahead of all types of equity with respect to priority of payment, and within the debt component of the capital structure, there can be varying levels of seniority.
- With respect to priority of claims, secured debt ranks ahead of unsecured debt, and within unsecured debt, senior debt ranks ahead of subordinated debt. In the typical case, all of an issuer's bonds have the same probability of default due to cross-default provisions in most indentures. Higher priority of claim implies higher recovery rate—lower loss severity—in the event of default.
- For issuers with more complex corporate structures—for example, a parent holding company that has operating subsidiaries—debt at the holding company is structurally subordinated to the subsidiary debt, although the possibility of more diverse assets and earnings streams from other sources could still result in the parent having higher effective credit quality than a particular subsidiary.
- Recovery rates can vary greatly by issuer and industry. They are influenced by the composition of an issuer's capital structure, where in the economic and credit cycle the default occurred, and what the market's view of the future prospects is for the issuer and its industry.
- The priority of claims in bankruptcy is not always absolute. It can be influenced by several factors, including some leeway accorded to bankruptcy judges, government involvement, or a desire on the part of the more senior creditors to settle with the more junior creditors and allow the issuer to emerge from bankruptcy as a going concern, rather than risking smaller and delayed recovery in the event of a liquidation of the borrower.
- Credit rating agencies, such as Moody's, Standard & Poor's, and Fitch, play a central role in the credit markets. Nearly every bond issued in the broad debt markets carries credit ratings, which are opinions about a bond issue's creditworthiness. Credit ratings enable investors to compare the credit risk of debt issues and issuers within a given industry, across industries, and across geographic markets.
- Bonds rated Aaa to Baa3 by Moody's and AAA to BBB– by Standard & Poor's (S&P) and/or Fitch (higher to lower) are referred to as "investment grade." Bonds rated lower than that—Ba1 or lower by Moody's and BB+ or lower by S&P and/or Fitch—are referred to

as "below investment grade" or "speculative grade." Below-investment-grade bonds are also called "high-yield" or "junk" bonds.

- The rating agencies rate both issuers and issues. Issuer ratings are meant to address an issuer's overall creditworthiness—its risk of default. Ratings for issues incorporate such factors as their rankings in the capital structure.
- The rating agencies will notch issue ratings up or down to account for such factors as capital structure ranking for secured or subordinated bonds, reflecting different recovery rates in the event of default. Ratings may also be notched due to structural subordination.
- There are risks in relying too much on credit agency ratings. Creditworthiness may change over time, and initial/current ratings do not necessarily reflect the creditworthiness of an issuer or bond over an investor's holding period. Valuations often adjust before ratings change, and the notching process may not adequately reflect the price decline of a bond that is lower ranked in the capital structure. Because ratings primarily reflect the probability of default but not necessarily the severity of loss given default, bonds with the same rating may have significantly different expected losses (default probability times loss severity). And like analysts, credit rating agencies may have difficulty forecasting certain credit-negative outcomes, such as adverse litigation, leveraging corporate transactions, and such low probability/high severity events as earthquakes and hurricanes.
- The role of corporate credit analysis is to assess the company's ability to make timely payments of interest and to repay principal at maturity.
- Credit analysis is similar to equity analysis. It is important to understand, however, that bonds are contracts and that management's duty to bondholders and other creditors is limited to the terms of the contract. In contrast, management's duty to shareholders is to act in their best interest by trying to maximize the value of the company—perhaps even at the expense of bondholders at times.
- Credit analysts tend to focus more on the downside risk given the asymmetry of risk/return, whereas equity analysts focus more on upside opportunity from earnings growth, and so on.
- The "4 Cs" of credit—capacity, collateral, covenants, and character—provide a useful framework for evaluating credit risk.
- Credit analysis focuses on an issuer's ability to generate cash flow. The analysis starts with an industry assessment—structure and fundamentals—and continues with an analysis of an issuer's competitive position, management strategy, and track record.
- Credit measures are used to calculate an issuer's creditworthiness, as well as to compare its credit quality with peer companies. Key credit ratios focus on leverage and interest coverage and use such measures as EBITDA, free cash flow, funds from operations, interest expense and balance sheet debt.
- An issuer's ability to access liquidity is also an important consideration in credit analysis.
- The higher the credit risk, the greater the offered/required yield and potential return demanded by investors. Over time, bonds with more credit risk offer higher returns but with greater volatility of return than bonds with lower credit risk.
- The yield on a credit-risky bond comprises the yield on a default risk–free bond with a comparable maturity plus a yield premium, or "spread," that comprises a credit spread and a liquidity premium. That spread is intended to compensate investors for credit risk—risk of default and loss severity in the event of default—and the credit-related risks that can cause spreads to widen and prices to decline—downgrade or credit migration risk and market liquidity risk.

$$\text{Yield spread} = \text{Liquidity premium} + \text{Credit spread}.$$

- In times of financial market stress, the liquidity premium can increase sharply, causing spreads to widen on all credit-risky bonds, with lower-quality issuers most affected. In times of credit improvement or stability, however, credit spreads can narrow sharply as well, providing attractive investment returns.
- Credit curves—the plot of yield spreads for a given bond issuer across the yield curve—are typically upward sloping, with the exception of high premium-priced bonds and distressed bonds, where credit curves can be inverted because of the fear of default, when all creditors at a given ranking in the capital structure will receive the same recovery rate without regard to debt maturity.
- The impact of spread changes on holding period returns for credit-risky bonds is a product of two primary factors: the basis point spread change and the sensitivity of price to yield as reflected by (end-of-period) modified duration and convexity. Spread narrowing enhances holding period returns, whereas spread widening has a negative impact on holding period returns. Longer-duration bonds have greater price and return sensitivity to changes in spread than shorter-duration bonds.

$$\text{Price impact} \approx -(\text{MDur} \times \Delta\text{Spread}) + \tfrac{1}{2}\text{Cvx} \times (\Delta\text{Spread})^2$$

- For high-yield bonds, with their greater risk of default, more emphasis should be placed on an issuer's sources of liquidity, as well as on its debt structure and corporate structure. Credit risk can vary greatly across an issuer's debt structure depending on the seniority ranking. Many high-yield companies have complex capital structures, resulting in different levels of credit risk depending on where the debt resides.
- Covenant analysis is especially important for high-yield bonds. Key covenants include payment restrictions, limitation on liens, change of control, coverage maintenance tests (often limited to bank loans), and any guarantees from restricted subsidiaries. Covenant language can be very technical and legalistic, so it may help to seek legal or expert assistance.
- An equity-like approach to high-yield analysis can be helpful. Calculating and comparing enterprise value with EBITDA and debt/EBITDA can show a level of equity "cushion" or support beneath an issuer's debt.
- Sovereign credit analysis includes assessing both an issuer's ability and willingness to pay its debt obligations. Willingness to pay is important because, due to sovereign immunity, a sovereign government cannot be forced to pay its debts.
- In assessing sovereign credit risk, a helpful framework is to focus on five broad areas: (1) institutional effectiveness and political risks, (2) economic structure and growth prospects, (3) external liquidity and international investment position, (4) fiscal performance, flexibility, and debt burden, and (5) monetary flexibility.
- Among the characteristics of a high-quality sovereign credit are the absence of corruption and/or challenges to political framework; governmental checks and balances; respect for rule of law and property rights; commitment to honor debts; high per capita income with stable, broad-based growth prospects; control of a reserve or actively traded currency; currency flexibility; low foreign debt and foreign financing needs relative to receipts in foreign currencies; stable or declining ratio of debt to GDP; low debt service as a percent of revenue; low ratio of net debt to GDP; operationally independent central bank; track record of low and stable inflation; and a well-developed banking system and active money market.
- Non-sovereign or local government bonds, including municipal bonds, are typically either general obligation bonds or revenue bonds.
- General obligation (GO) bonds are backed by the taxing authority of the issuing non-sovereign government. The credit analysis of GO bonds has some similarities to sovereign

analysis—debt burden per capita versus income per capita, tax burden, demographics, and economic diversity. Underfunded and "off-balance-sheet" liabilities, such as pensions for public employees and retirees, are debt-like in nature.

- Revenue-backed bonds support specific projects, such as toll roads, bridges, airports, and other infrastructure. The creditworthiness comes from the revenues generated by usage fees and tolls levied.

PROBLEMS

1. The risk that a bond's creditworthiness declines is *best* described by:
   A. credit migration risk.
   B. market liquidity risk.
   C. spread widening risk.
2. Stedsmart Ltd and Fignermo Ltd are alike with respect to financial and operating characteristics, except that Stedsmart Ltd has less publicly traded debt outstanding than Fignermo Ltd. Stedsmart Ltd is *most likely* to have:
   A. no market liquidity risk.
   B. lower market liquidity risk.
   C. higher market liquidity risk.
3. In the event of default, the recovery rate of which of the following bonds would *most likely* be the highest?
   A. First mortgage debt
   B. Senior unsecured debt
   C. Junior subordinate debt
4. During bankruptcy proceedings of a firm, the priority of claims was not strictly adhered to. Which of the following is the *least likely* explanation for this outcome?
   A. Senior creditors compromised.
   B. The value of secured assets was less than the amount of the claims.
   C. A judge's order resulted in actual claims not adhering to strict priority of claims.
5. A fixed income analyst is *least likely* to conduct an independent analysis of credit risk because credit rating agencies:
   A. may at times mis-rate issues.
   B. often lag the market in pricing credit risk.
   C. cannot foresee future debt-financed acquisitions.
6. If goodwill makes up a large percentage of a company's total assets, this *most likely* indicates that:
   A. the company has low free cash flow before dividends.
   B. there is a low likelihood that the market price of the company's common stock is below book value.
   C. a large percentage of the company's assets are not of high quality.
7. In order to analyze the **collateral** of a company a credit analyst should assess the:
   A. cash flows of the company.
   B. soundness of management's strategy.
   C. value of the company's assets in relation to the level of debt.

8. In order to determine the **capacity** of a company, it would be *most* appropriate to analyze the:
   A. company's strategy.
   B. growth prospects of the industry.
   C. aggressiveness of the company's accounting policies.
9. A credit analyst is evaluating the creditworthiness of three companies: a construction company, a travel and tourism company, and a beverage company. Both the construction and travel and tourism companies are cyclical, whereas the beverage company is non-cyclical. The construction company has the highest debt level of the three companies. The highest credit risk is *most likely* exhibited by the:
   A. construction company.
   B. beverage company.
   C. travel and tourism company.
10. Based on the information provided in Exhibit 1, the EBITDA interest coverage ratio of Adidas AG is *closest* to:
   A. 7.91x.
   B. 10.12x.
   C. 12.99x.

EXHIBIT 1 Adidas AG Excerpt from Consolidated Income Statement in a given year (€ in millions)

Gross profit	5,730
Royalty and commission income	100
Other operating income	110
Other operating expenses	5,046
Operating profit	894
Interest income	25
Interest expense	113
Income before taxes	806
Income taxes	238
Net income	568
Additional information:	
Depreciation and amortization: €249 million	

Source: Adidas AG Annual Financial Statements, December 2010

11. The following information is from the annual report of Adidas AG for December 2010:
   - Depreciation and amortization: €249 million
   - Total assets: €10,618 million
   - Total debt: €1,613 million
   - Shareholders' equity: €4,616 million

   The debt/capital ratio of Adidas AG is *closest* to:
   A. 15.19%.
   B. 25.90%.
   C. 34.94%.

12. Funds from operations (FFO) of Pay Handle Ltd increased in 2011. In 2011 the total debt of the company remained unchanged, while additional common shares were issued. Pay Handle Ltd's ability to service its debt in 2011, as compared to 2010, *most likely*:
    A. improved.
    B. worsened.
    C. remained the same.
13. Based on the information in Exhibit 2, Grupa Zywiec SA's credit risk is *most likely*:
    A. lower than the industry.
    B. higher than the industry.
    C. the same as the industry.

EXHIBIT 2 European Food, Beverage, and Tobacco Industry and Grupa Zywiec SA Selected Financial Ratios for 2010

	Total debt/Total capital (%)	FFO/Total debt (%)	Return on capital (%)	Total debt/ EBITDA (x)	EBITDA interest coverage (x)
Grupa Zywiec SA	47.1	77.5	19.6	1.2	17.7
Industry Median	**42.4**	**23.6**	**6.55**	**2.85**	**6.45**

14. Based on the information in Exhibit 3, the credit rating of Davide Campari-Milano S.p.A. is *most likely*:
    A. lower than Associated British Foods plc.
    B. higher than Associated British Foods plc.
    C. the same as Associated British Foods plc.

EXHIBIT 3 European Food, Beverage, and Tobacco Industry; Associated British Foods plc; and Davide Campari-Milano S.p.A. Selected Financial Ratios, 2010

Company	Total debt/total capital (%)	FFO/total debt (%)	Return on capital (%)	Total debt/ EBITDA (x)	EBITDA interest coverage (x)
Associated British Foods plc	0.2	84.3	0.1	1.0	13.9
Davide Campari-Milano S.p.A.	42.9	22.9	8.2	3.2	3.2
European Food, Beverage, and Tobacco Median	**42.4**	**23.6**	**6.55**	**2.85**	**6.45**

15. Holding all other factors constant, the *most likely* effect of low demand and heavy new issue supply on bond yield spreads is that yield spreads will:
    A. widen.
    B. tighten.
    C. not be affected.
16. Credit risk of a corporate bond is *best* described as the:
    A. risk that an issuer's creditworthiness deteriorates.
    B. probability that the issuer fails to make full and timely payments.
    C. risk of loss resulting from the issuer failing to make full and timely payments.

17. The risk that the price at which investors can actually transact differs from the quoted price in the market is called:
    A. spread risk.
    B. credit migration risk.
    C. market liquidity risk.
18. Loss severity is *best* described as the:
    A. default probability multiplied by the loss given default.
    B. portion of a bond's value recovered by bondholders in the event of default.
    C. portion of a bond's value, including unpaid interest, an investor loses in the event of default.
19. The two components of credit risk are default probability and:
    A. spread risk.
    B. loss severity.
    C. market liquidity risk.
20. For a high-quality debt issuer with a large amount of publicly traded debt, bond investors tend to devote *most* effort to assessing the issuer's:
    A. default risk.
    B. loss severity.
    C. market liquidity risk.
21. The expected loss for a given debt instrument is estimated as the product of default probability and:
    A. (1 + Recovery rate).
    B. (1 − Recovery rate).
    C. 1/(1 + Recovery rate).
22. The priority of claims for senior subordinated debt is:
    A. lower than for senior unsecured debt.
    B. the same as for senior unsecured debt.
    C. higher than for senior unsecured debt.
23. A senior unsecured credit instrument holds a higher priority of claims than one ranked as:
    A. mortgage debt.
    B. second lien loan.
    C. senior subordinated.
24. In a bankruptcy proceeding, when the absolute priority of claims is enforced:
    A. senior subordinated creditors rank above second lien holders.
    B. preferred equity shareholders rank above unsecured creditors.
    C. creditors with a secured claim have the first right to the value of that specific property.
25. In the event of default, which of the following is *most likely* to have the highest recovery rate?
    A. Second lien
    B. Senior unsecured
    C. Senior subordinated
26. The process of moving credit ratings of different issues up or down from the issuer rating in response to different payment priorities is *best* described as:
    A. notching.
    B. structural subordination.
    C. cross-default provisions.
27. The factor considered by rating agencies when a corporation has debt at both its parent holding company and operating subsidiaries is *best* referred to as:
    A. credit migration risk.
    B. corporate family rating.
    C. structural subordination.

28. Which type of security is *most likely* to have the same rating as the issuer?
    A. Preferred stock
    B. Senior secured bond
    C. Senior unsecured bond
29. Which of the following corporate debt instruments has the highest seniority ranking?
    A. Second lien
    B. Senior unsecured
    C. Senior subordinated
30. An issuer credit rating usually applies to a company's:
    A. secured debt.
    B. subordinated debt.
    C. senior unsecured debt.
31. The rating agency process whereby the credit ratings on issues are moved up or down from the issuer rating *best* describes:
    A. notching.
    B. pari passu ranking.
    C. cross-default provisions.
32. The notching adjustment for corporate bonds rated Aa2/AA is *most likely*:
    A. larger than the notching adjustment for corporate bonds rated B2/B.
    B. the same as the notching adjustment for corporate bonds rated B2/B.
    C. smaller than the notching adjustment for corporate bonds rated B2/B.
33. Which of the following statements about credit ratings is *most accurate*?
    A. Credit ratings can migrate over time.
    B. Changes in bond credit ratings precede changes in bond prices.
    C. Credit ratings are focused on expected loss rather than risk of default.
34. Which industry characteristic *most likely* has a positive effect on a company's ability to service debt?
    A. Low barriers to entry in the industry
    B. High number of suppliers to the industry
    C. Broadly dispersed market share among large number of companies in the industry
35. When determining the capacity of a borrower to service debt, a credit analyst should begin with an examination of:
    A. industry structure.
    B. industry fundamentals.
    C. company fundamentals.
36. Which of the following accounting issues should *mostly likely* be considered a character warning flag in credit analysis?
    A. Expensing items immediately
    B. Changing auditors infrequently
    C. Significant off-balance-sheet financing
37. In credit analysis, capacity is *best* described as the:
    A. quality of management.
    B. ability of the borrower to make its debt payments on time.
    C. quality and value of the assets supporting an issuer's indebtedness.
38. Among the Four Cs of credit analysis, the recognition of revenue prematurely *most likely* reflects a company's:
    A. character.
    B. covenants.
    C. collateral.

Use the following Exhibit for Questions 39 and 40

EXHIBIT 4 Industrial Comparative Ratio Analysis, Year 20XX

	EBITDA Margin (%)	Return on Capital (%)	EBIT/Interest Expense (×)	EBITDA/ Interest Expense (×)	Debt/ EBITDA (×)	Debt/Capital (%)
Company A	25.1	25.0	15.9	19.6	1.6	35.2
Company B	29.6	36.3	58.2	62.4	0.5	15.9
Company C	21.8	16.6	8.9	12.4	2.5	46.3

39. Based on only the leverage ratios in Exhibit 4, the company with the *highest* credit risk is:
    A. Company A.
    B. Company B.
    C. Company C.
40. Based on only the coverage ratios in Exhibit 4, the company with the *highest* credit quality is:
    A. Company A.
    B. Company B.
    C. Company C.

Use the following Exhibits for Questions 41 and 42

EXHIBIT 5 Consolidated Income Statement (£ millions)

	Company X	Company Y
Net revenues	50.7	83.7
Operating expenses	49.6	70.4
Operating income	1.1	13.3
Interest income	0.0	0.0
Interest expense	0.6	0.8
Income before income taxes	0.5	12.5
Provision for income taxes	−0.2	−3.5
Net income	0.3	9.0

EXHIBIT 6 Consolidated Balance Sheets (£ millions)

	Company X	Company Y
ASSETS		
Current assets	10.3	21.9
Property, plant, and equipment, net	3.5	20.1
Goodwill	8.3	85.0
Other assets	0.9	5.1
Total assets	23.0	132.1
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities		
Accounts payable and accrued expenses	8.4	16.2
Short-term debt	0.5	8.7
Total current liabilities	8.9	24.9
Long-term debt	11.7	21.1
Other non-current liabilities	1.1	22.1
Total liabilities	21.7	68.1
Total shareholders' equity	1.3	64.0
Total liabilities and shareholders' equity	23.0	132.1

EXHIBIT 7 Consolidated Statements of Cash Flow (£ millions)

	Company X	Company Y
CASH FLOWS FROM OPERATING ACTIVITIES		
Net income	0.3	9.0
Depreciation	1.0	3.8
Goodwill impairment	2.0	1.6
Changes in working capital	0.0	–0.4
Net cash provided by operating activities	3.3	14.0
CASH FLOWS FROM INVESTING ACTIVITIES		
Additions to property and equipment	–1.0	–4.0
Additions to marketable securities	–0.1	0.0
Proceeds from sale of property and equipment	0.2	2.9
Proceeds from sale of marketable securities	0.3	0.0
Net cash used in investing activities	–0.6	–1.1

EXHIBIT 7 (Continued)

	Company X	Company Y
CASH FLOWS FROM FINANCING ACTIVITIES		
Repurchase of common stock	−1.5	−4.0
Dividends to shareholders	−0.3	−6.1
Change in short-term debt	0.0	−3.4
Additions to long-term debt	3.9	3.9
Reductions in long-term debt	−3.4	−2.5
Net cash – financing activities	−1.3	−12.1
NET INCREASE IN CASH AND CASH EQUIVALENTS	1.4	0.8

41. Based on Exhibits 5–7, in comparison to Company X, Company Y has a higher:
    A. debt/capital ratio.
    B. debt/EBITDA ratio.
    C. free cash flow after dividends/debt ratio.
42. Based on Exhibits 5–7, in comparison to Company Y, Company X has greater:
    A. leverage.
    B. interest coverage.
    C. operating profit margin.

43. Credit yield spreads *most likely* widen in response to:
    A. high demand for bonds.
    B. weak performance of equities.
    C. strengthening economic conditions.
44. The factor that *most likely* results in corporate credit spreads widening is:
    A. an improving credit cycle.
    B. weakening economic conditions.
    C. a period of high demand for bonds.
45. Credit spreads are *most likely* to widen:
    A. in a strengthening economy.
    B. as the credit cycle improves.
    C. in periods of heavy new issue supply and low borrower demand.
46. Which of the following factors in credit analysis is more important for general obligation non-sovereign government debt than for sovereign debt?
    A. Per capita income
    B. Power to levy and collect taxes
    C. Requirement to balance an operating budget
47. In contrast to high-yield credit analysis, investment-grade analysis is *more likely* to rely on:
    A. spread risk.
    B. an assessment of bank credit facilities.
    C. matching of liquidity sources to upcoming debt maturities.
48. Which of the following factors would *best* justify a decision to avoid investing in a country's sovereign debt?
    A. Freely floating currency
    B. A population that is not growing
    C. Suitable checks and balances in policymaking