

R31 Capital Structure

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Version 1.1

1. Introduction

Capital structure refers to the combination of equity and debt a company uses to finance its assets and operations.

In this reading we will review some key factors affecting capital structure such as:

- **Company life cycle:** As companies mature their business risk decreases and operating cash flows become more predictable, allowing for greater use of leverage.
- **Cost of capital:** The cost of debt is low relative to the cost of equity. Also interest expense is tax deductible. Therefore, it is beneficial for companies to use debt in their capital structure. However, higher leverage can also increase the potential costs of financial distress.

A company's management seeks to find an optimal capital structure that balances the benefits of higher leverage with its costs. At this point, the company's weighted average cost of capital (WACC) is minimized and shareholder value is maximized.

- **Financing considerations:** Financing decisions are typically tied to investment spending. A company's management also has to consider the company's ability to service debt given its nature of business and operating cash flows.
- **Competing stakeholder interest:** While trying to maximize shareholder wealth, a company's management may make capital structure decisions that favor shareholders at the expense of other stakeholders such as debt holders, suppliers, customers, or employees.

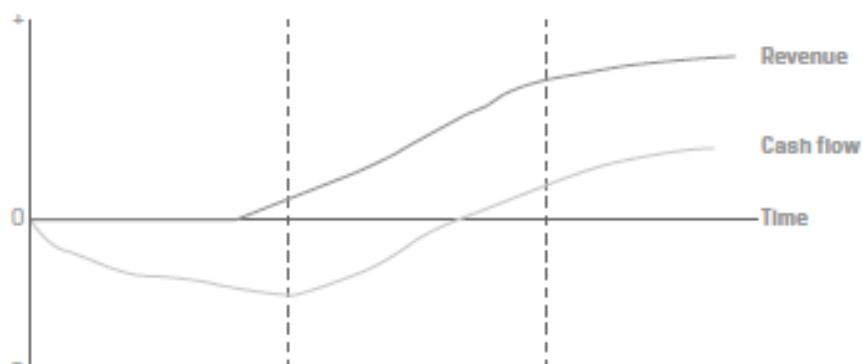
2. Capital Structure and Company Life Cycle

In this section we will look at the typical changes in a company's capital structure as it evolves from a start-up, to a growth business, to a mature business.

2.1 Background

A company's life cycle stage influences its cash flow characteristics, its ability to support debt; and is therefore a primary factor in determining capital structure. Any capital that is not sourced through borrowing must come from equity.

As companies mature and move from start-up, through growth, to maturity, their business risk typically declines, and their operating cash flows turn positive and become more predictable. This allows for greater use of leverage at more attractive terms. This is illustrated in Exhibit 1 from the curriculum.



Stage in life cycle	Start-up	Growth	Mature
Financial management			
Revenue growth	Beginning	Rising	Slowing
Cash flow	Negative	Improving	Positive/Predictable
Business risk	High	Medium	Low
Debt capital/leverage			
Availability	Very limited	Limited/improving	High
Cost	High	Medium	Low
Typical cases	N/A	Secured (by receivables, fixed assets)	Unsecured (bank and public debt)
Typical % of capital structure ¹	Close to 0%	0%-20%	20% +

2.2 Start-Ups

- In this stage a company's revenues are close to zero and a lot of investment is required to move from the prototype stage to commercial production.
- Therefore, cash flow is usually negative.
- The risk of business failure is high.
- The company typically raises capital through equity rather than debt.
- Equity is generally sourced through private markets (venture capital) rather than public markets.
- Debt is generally not available or is very expensive. It is usually a negligible component of the capital structure.

2.3 Growth Businesses

- In this stage a company typically experiences high revenue growth but investment is needed to achieve this growth.
- Therefore, cash flow may be negative but it is likely to be improving and becoming more predictable.
- The risk of business failure decreases.
- As the business becomes more attractive to lenders, debt financing may be available at reasonable terms. The company may also have assets that it can use to secure debt.

- However, most companies use debt conservatively to retain their operational and financial flexibility.
- Equity is generally the main source of capital.

2.4 Mature Businesses

- In this stage a company typically experiences a slowdown in revenue growth; and growth-related investment spending decreases.
- Cash flow is usually positive and predictable.
- The risk of business failure is low.
- Debt financing is available at attractive terms often on an unsecured basis.
- To take advantage of the cheaper debt (as compared to equity) companies typically use significant leverage.
- Over time a company may experience de-leveraging due to continuous positive cash flow generation and share price appreciation.
- To offset this de-leveraging companies typically buy back shares and reduce the proportion of equity in the capital structure.

2.5 Unique Situations

In the preceding sections we established a general relationship between company maturity and capital structure. However, there are three important exceptions:

- Capital intensive businesses with marketable assets: Business such as real estate, utilities, shipping, airline etc. are highly capital intensive. Also, the underlying assets can be bought and sold fairly easily and make for a good collateral. Such businesses tend to use high levels of leverage irrespective of their maturity stage.
- Cyclical industries: The revenues and cash flows of companies in cyclical industries (e.g., mining) fluctuate widely with the business cycle. Therefore, such companies tend to use less debt in their capital structure as compared to other companies in less cyclical industries.
- “Capital-light” businesses: Some businesses such as software can scale easily and do not require substantial investments in fixed or working capital to support growth. They are typically cash flow positive from an early stage and never need to raise large amounts of capital. Therefore, they tend to use very little debt in their capital structure.

3. Modigliani–Miller Propositions

3.1 MM Proposition I without Taxes: Capital Structure Irrelevance

Economists Modigliani and Miller claimed the following proposition, given no taxes and a certain set of assumptions:

MM Proposition I: The market value of the company is not affected by the capital structure

of the company.

$$V_L = V_U$$

where:

V_L = value of the levered firm

V_U = value of the unlevered firm

In other words, the value of a company is determined solely by its cash flows, not by the relative reliance on debt and equity capital.

The assumptions made were:

1. Homogeneous expectations: All investors have the same expectations with respect to the cash flows from an investment in bonds or stock.
2. Perfect capital markets: There are no transaction costs, no taxes, no bankruptcy costs, and everyone has the same information.
3. Risk-free rate: Investors can borrow and lend at the risk-free rate.
4. No agency costs: Managers always act to maximize shareholder wealth.
5. Independent decisions: Financing and investment decisions are independent of each other. Operating income is unaffected by changes in the capital structure.

We can explain MM's capital structure irrelevance proposition in terms of a pie. Suppose the total value of a company is represented by a pie. Slices represents how much of the total capital is contributed by debt and equity. Depending on the capital structure, the pie can be split in any number of ways, but the size of the pie will remain the same. This is illustrated in the figures below.



3.2 MM Proposition II without Taxes: Higher Financial Leverage Raises the Cost of Equity

Modigliani and Miller's second proposition focuses on the cost of capital of the company.

MM Proposition II: The cost of equity is a linear function of the company's debt-to-equity ratio.

$$r_e = r_0 + (r_0 - r_d) \frac{D}{E}$$

where:

r_0 is the cost of capital for a company financed only by equity and has zero debt

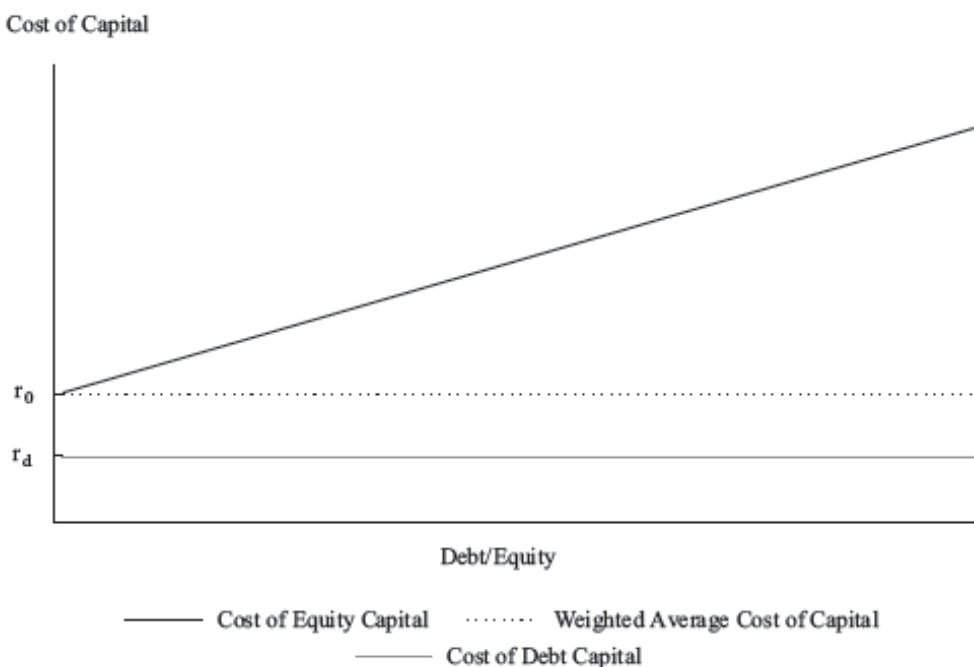
r_d is the cost of debt

r_e is the cost of equity

D/E = debt-to-equity ratio

As D/E rises, i.e. the company increases the use of debt, the cost of equity (r_e) rises. We know from MM Proposition I that the value of a company is unaffected by changes in D/E and the WACC remains constant. Proposition II then implies that the cost of equity increases in such a manner as to exactly offset the increased use of cheaper debt in order to maintain a constant WACC. Under this proposition, WACC is determined by the business risk of the company, and not by the capital structure.

MM Proposition II is illustrated in the figure below.



As leverage increases, the cost of equity increases, but WACC and the cost of debt remain constant.

Systematic Risk

The systematic risk or beta of a company's assets is a weighted average of the systematic risks of its source of capital.

$$\beta_a = \left(\frac{D}{V}\right) \beta_d + \left(\frac{E}{V}\right) \beta_e$$

where:

β_a = asset beta

β_d = debt beta

β_e = equity beta

According to MM, as the use of debt rises the risk borne by equity holders rises, and therefore the equity beta rises.

$$\beta_e = \beta_a + (\beta_a - \beta_d) \left(\frac{D}{E} \right)$$

3.3 MM Propositions with Taxes: Taxes, Cost of Capital, and Value of the Company

The discussion so far has ignored taxes. In this section, we will present MM propositions I and II with taxes. As interest paid is tax deductible, the use of debt provides a tax shield that increases the value of a company. If we ignore the costs of financial distress and bankruptcy, the value of the company increases as we take on more debt.

MM Proposition I with taxes: The value of a levered company is equal to the value of an unlevered company plus the value of the debt tax shield.

$$V_L = V_U + tD$$

where:

V_L = value of the levered firm

V_u = value of the unlevered firm

t = marginal tax rate

D = value of debt in the capital structure

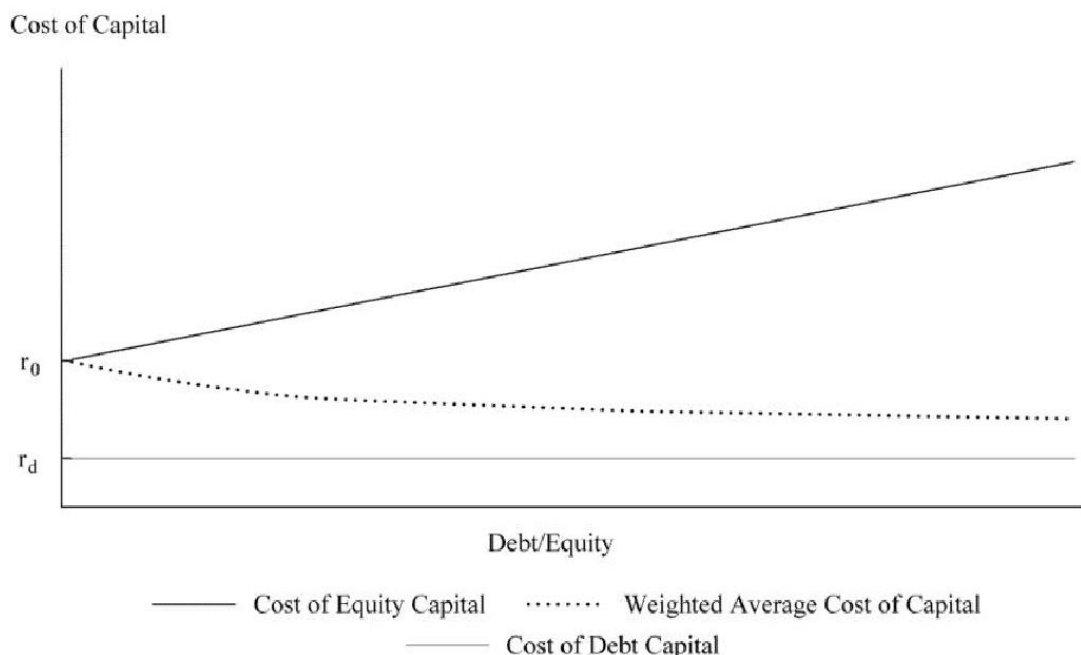
The term tD is often referred to as the debt tax shield

MM Proposition II with taxes: The cost of equity is a linear function of the company's debt-to-equity ratio with an adjustment for the tax rate.

The cost of equity increases as the company increases the amount of debt in its capital structure, but the cost of equity does not rise as fast as it does in the no tax case.

$$r_e = r_0 + (r_0 - r_d)(1 - t) \frac{D}{E}$$

WACC for a leveraged company falls as debt increases, and therefore the overall company value increases. This is illustrated in the figure below:



The table below provides a summary of MM propositions.

	Without Taxes	With Taxes
Proposition I	$V_L = V_U$	$V_L = V_U + tD$
Proposition II	$r_e = r_0 + (r_0 - r_d) D/E$	$r_e = r_0 + (r_0 - r_d)(1 - t) D/E$

3.4 Costs of Financial Distress

The disadvantage of operating and financial leverage is that earnings are magnified downward during economic slowdown. Lower or negative earnings put companies under stress, and this financial distress adds costs to a company.

The costs of financial distress can be classified into direct and indirect costs. Direct costs include the actual cash expenses associated with the bankruptcy process, such as legal and administrative fees. Indirect costs include forgone investment opportunities, impaired ability to conduct business, and agency costs associated with the debt during periods in which the company is near or in bankruptcy.

The costs of financial distress are lower for companies whose assets have a ready secondary market. For example, airlines, shipping companies etc.

The probability of financial distress and bankruptcy increases as the degree of leverage increases. The probability of bankruptcy depends, in part, on the company's business risk. Other factors that affect the likelihood of bankruptcy include the company's corporate governance structure and the management of the company.

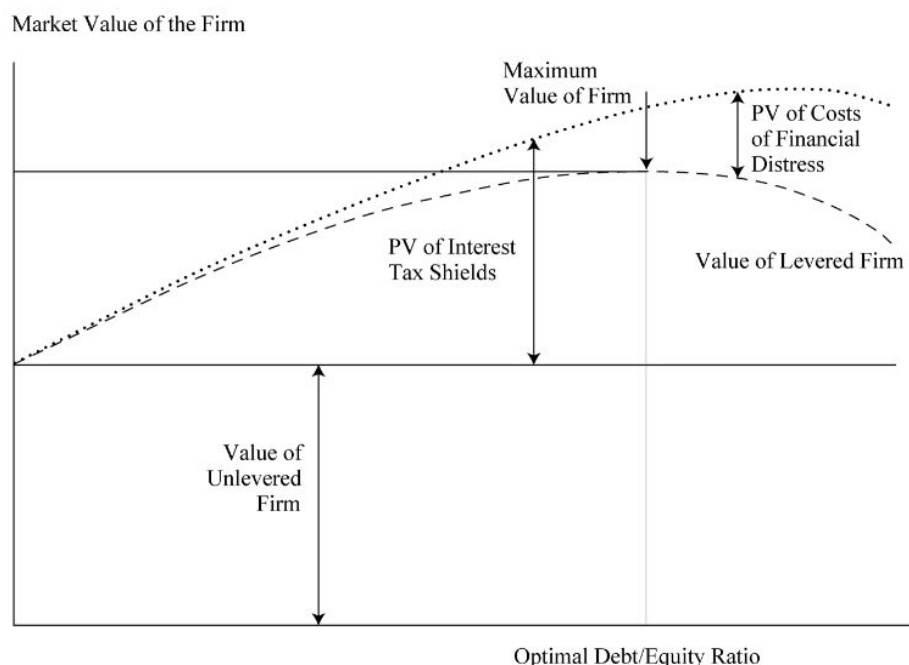
4. Optimal and Target Capital Structure

The optimal capital structure is the one at which the value of the company is maximized.

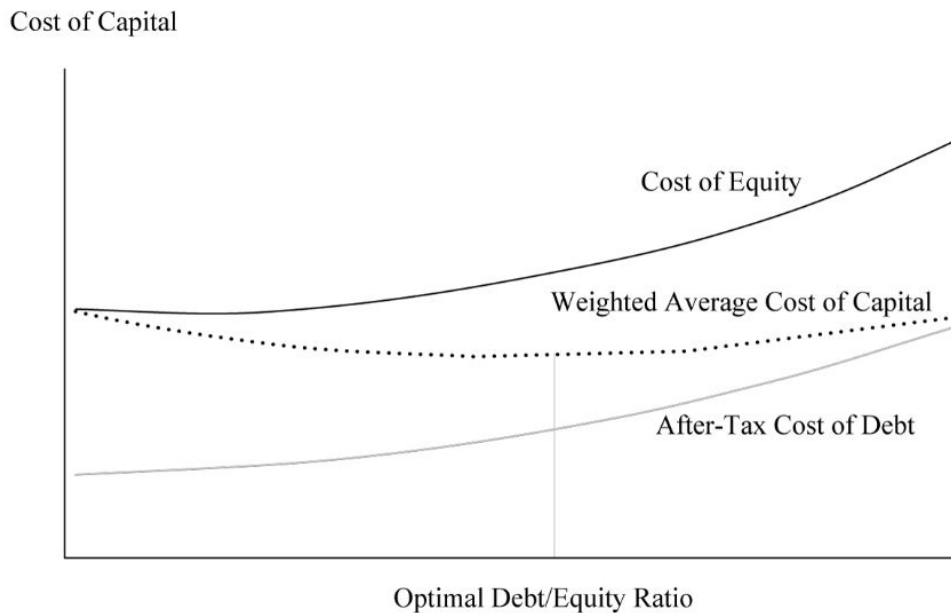
The static trade-off theory is based on balancing the expected costs from financial distress against the tax benefits of debt service payments. Considering only the tax shield provided by debt and the costs of financial distress, the expression for the value of a leveraged company becomes:

$$V_L = V_U + tD - PV(\text{Costs of financial distress})$$

PV(Costs of financial distress) refers to the present value of the expected costs of financial distress. This equation represents the static trade-off theory of capital structure. It results in an optimal capital structure where debt is less than 100%. This can be seen in Exhibit 4 from the curriculum.



WACC is minimum at the point where the firm value is maximized.



When a company identifies its most appropriate capital structure, it may adopt this as its target capital structure. However, a company's capital structure may vary from its target because management may try to take advantage of short-term opportunities in alternate financing sources. Market value variations also continuously affect the company's capital structure. Sometimes, it may be impractical and expensive for a company to maintain its target structure. However, as long as the assumptions of the analysis and the target are unchanged, analysts and management should focus on the target capital structure.

What WACC weights to use?

When conducting an analysis if we know the company's target capital structure, then we should use it in our analysis. However, analysts typically do not know a company's target capital structure. It can be estimated using one of these methods:

1. Assume the company's current capital structure, at market value weights for the components, represents the company's target capital structure.
2. Examine trends in the company's capital structure or statements by management regarding capital structure policy to infer the target capital structure.
3. Use averages of comparable companies' capital structures as the target capital structure.

5. Factors Affecting Capital Structure Decisions

In theory, an optimal capital structure is the one at which the company's WACC is minimized and company value maximized. It represents a trade-off between the cost-effectiveness of debt and the expected costs of financial distress.

However, in reality many practical considerations affect the capital structure. These include:

- Capital structure policies and targets: Management and the board of directors often set guidelines to define reasonable credit limits for the company based on its risk appetite and capacity to sustain debt.
- Capital investment financing: Acquisitions or other major investments may present financing opportunities or requirements.
- Market conditions: Current share price levels and market interest rates for a company's debt; and
- Asymmetric information: The unequal distribution of information between management and other stakeholders.

5.1 Capital Structure Policies and Target Capital Structures

In practice, estimating a company's cost of equity capital or the costs of financial distress is challenging. As a result, debt-oriented capital structure policies are commonly used. They define reasonable limits for borrowing by the company, for example, debt/equity less than 0.5 times.

Debt ratings

Debt ratings are independent, third-party assessments of the quality and safety of a company's debt. They are based on the analysis of the company's ability to pay the promised cash flows. Debt ratings are an important factor in the practical management of leverage. Since borrowing costs are closely tied to the bond ratings, maintaining the company's rating at a certain level can also be an explicit goal for management.

As leverage rises, rating agencies tend to lower the ratings of the company's debt. This is done to reflect the higher credit risk resulting from the increasing leverage. Lower ratings signify higher risk to both equity and debt capital providers, who in turn demand higher returns.

Market value v/s book value

The optimal capital structure should be calculated using the market value of equity and debt. However, company capital structure targets often use book values instead because:

- Market values can fluctuate a lot and they do not necessarily impact the appropriate level of borrowing. For example, a company that has seen a rapid share price increase may decide to take advantage of this situation and issue even more equity instead of debt.
- The management is primarily concerned with the amount and types of capital invested 'by' the company and not 'in' the company.
- Lenders and rating agencies typically focus on the book value of debt and equity for their calculation measures.

5.2 Financing Capital Investments

In practice, financing decisions are usually linked to investment spending – and often to a particular investment or acquisition.

The nature of the investments may or may not be suited to leverage. For example, assets that are relatively easy to market (e.g. real estate) are considered to be a strong collateral and are suitable to leverage. Whereas, assets that are tied to the parent's operation (e.g. a service operation) are less suitable to leverage.

To reduce risks a company must match the cash flows and maturity structures of their assets and liabilities. A company that finances long-term assets with short-term obligations faces rollover risk. Whereas, a company that finances short-term assets with long-term obligations faces the risk of overpaying in financing cost.

5.3 Market Conditions

Financing decisions are often opportunistic. Managers consider the share price of their company as well as market interest rates for their debt when deciding when, how much, and what type of capital to raise.

Another important consideration is whether their debt or equity issuance meets index provide requirements. Inclusion in a benchmark index can significantly affect the demand for these securities.

5.4 Information Asymmetries and Signaling

Managers have more information about a company's performance and prospects than outsiders, such as owners and investors. This is referred to as information asymmetry. Investors demand higher returns when asymmetry of information is high because this increases the probability of agency costs.

Investors closely watch manager's decision for insights into the company's future prospects. Managers may provide information to investors ("signaling") through their choice of financing method. Fixed payment commitments, for example, can indicate management's confidence in the company's future prospects.

Being aware of this, managers take into account how their actions might be interpreted by outsiders.

Pecking Order Theory: This theory suggests that managers choose methods of financing that send the least signal to outsiders. The preferred hierarchy for financing is:

- First preference: internal financing (retained earnings)
- Second preference: debt financing
- Third preference: equity financing

6. Agency Costs

Agency costs arise due to conflicts of interest when an agent makes decisions for a principal. All public companies and large private companies are usually managed by non-

owners. Therefore, an agency cost in the context of a corporation is a consequence of a conflict of interest between managers and owners. Since outside shareholders are aware of this conflict, they will take steps that incur costs such as:

- Costs borne by owners to monitor the management of the company, e.g., expenses of the annual report, board of director expenses, etc.
- Costs borne by management to assure owners that they are maximizing the company value, e.g., the implicit cost of noncompete employment contracts and the explicit cost of insurance to guarantee performance.

The better a company is governed, the lower the agency costs.

Free Cash Flow Hypothesis: As per this hypothesis, high debt levels discipline managers by forcing them to make fixed debt service payments and by reducing the company's free cash flow. The more financially levered the company is, the less freedom managers have to misuse cash. Thus, high leverage reduces agency costs.

7. Stakeholder Interests

7.1 Shareholder vs. Stakeholder Theory

Exhibit 5 from the curriculum lists the primary stakeholder groups for a company.

Providers of Capital	Other Stakeholders
Equity shareholders	Customers
<ul style="list-style-type: none"> ▪ Public (minority) common shareholders ▪ Controlling shareholders (founders, private equity) 	Suppliers
Preferred shareholders	Employees
Debtholders	Managers
<ul style="list-style-type: none"> ▪ Public debtholders ▪ Bank lenders ▪ Private lenders 	Directors
	Regulators, Governments

Shareholder theory is based on the premise that the goal of a company is to maximize shareholder returns.

Stakeholder theory is based on the premise that a company's focus is not restricted to shareholders, but extends to other stakeholders as well such as its customers, employees, suppliers, etc.

Management's capital structure decisions have varying effects on various stakeholder groups. Conflicts of interest may arise when attempting to maximize shareholder wealth, in

which one or more groups are favored at the expense of others.

7.2 Debt vs. Equity Conflict

- In exchange for the capital provided, debtholders expect periodic interest payments and principal repayment at maturity.
- Unlike equity shareholders, they do not directly benefit from a company's strong performance and prefer cash flow stability.
- As a result, debt holders will almost always prefer decisions that reduce the leverage and financial risk of a company. Common shareholders, on the other hand, often prefer higher leverage levels that provide them with greater return potential.

Other debt considerations:

- Seniority and security: In the event of a default, secured lenders are likely to recover more of their principal than unsecured lenders. Similarly, senior debt is likely to recover more than subordinated debt.
- Long-term vs. short-term debt: Because uncertainty increases with time horizon, the potential debt/equity conflict is greater in the case of long-term debt rather than short-term debt.
- Safeguards for debtholders: Debtholders typically impose debt covenants to protect their interests. Positive covenants specify what the borrower must do, such as keep financial ratios within certain limits. Negative covenants specify what the borrower must not do, such as additional secured borrowing or dividend payments.

7.3 Preferred Shareholders

Preferred shares are frequently referred to as “hybrid” securities because they possess both debt-like and equity-like characteristics. Failure to pay a preferred dividend is not a default event for a company, but it generally prevents common shareholders from receiving dividends until preferred shareholders are paid. Thus, preferred equity creates less risk for a company as compared to debt.

Preferred shareholders are vulnerable to decisions that increase financial leverage and risk over the long term, as this may gradually erode the company's ability to pay preferred dividends.

7.4 Private Equity Investors/Controlling Shareholders

Shareholders who have a majority voting interest are called controlling shareholders. Sometimes, they may have goals that conflict with those of other minority shareholders.

Private equity majority shareholders frequently exercise control by appointing board members and senior management.

7.5 Bank and Private Lenders

The general perspective of debtholders also applies to bank and private lenders - Less

financial leverage implies less risk and is thus preferred. However, there are stakeholder differences between holders of public debt, private debt, and bank lenders.

To make investment decisions, public market debtholders rely on public information and credit rating agencies. Because they may not hold debt securities to maturity, their returns reflect changes in the price of the securities over time rather than just the borrower's ability to pay interest and principal.

Banks and private lenders typically hold company debt until it matures. They usually have direct access to company management as well as non-public information about the company, which reduces information asymmetries. They may also be able to exert greater influence on the company than public market debtholders.

7.6 Other Stakeholders

Customers and suppliers

Customers and suppliers invest significant time and effort in establishing vendor relationships and have a natural interest in the long-term stability of a company. This is especially true for a company that manufactures specialized products, which have a high "switching barrier." Even if there is no actual or anticipated financial distress, financial stability can be an important vendor selection criterion.

Employees

Long-term stability, survival, and growth of a company are important considerations in attracting and retaining employees. Equity ownership is typically a minor component of compensation and a less important consideration.

Management and directors

Compensation is the primary tool used to align the interests of management, directors, and shareholders. Equity compensation can account for a sizable portion of their total compensation. However, the alignment of managers' and shareholders' interests is never perfect. Some examples are:

- The overall level of director or executive compensation can be excessive. This can result in "entrenchment," which is the avoidance of risk motivated by the desire to maintain one's position.
- When senior management compensation is tied to the size of the company, it can lead to "growth for growth's sake" or "empire building".
- The use of management stock options can encourage excessive risk-taking behavior.

Regulators and government

Regulators and the government are often key stakeholders for a company. In some cases, the company's capital structure is an important consideration for regulators. For example, regulators require financial institutions to maintain certain levels of solvency or capital

adequacy.

In order to stay in business, distressed companies may seek government assistance. In turn the government may require new equity investments, block dividends, or otherwise limit the company's financing decisions.

Summary

LO.a: Describe how a company's capital structure may change over its life cycle.

A company's life cycle stage influences its cash flow characteristics, its ability to support debt; and is therefore a primary factor in determining capital structure. Any capital that is not sourced through borrowing must come from equity.

As a company matures and progresses from start-up to growth to maturity, its business risk typically decreases, and its operating cash flows turn positive and more predictable. This enables greater use of leverage at more favorable terms.

LO.b: Explain the Modigliani–Miller propositions regarding capital structure.

	Without Taxes	With Taxes
Proposition I	$V_L = V_U$	$V_L = V_U + tD$
Proposition II	$r_e = r_0 + (r_0 - r_d) D/E$	$r_e = r_0 + (r_0 - r_d)(1 - t) D/E$

LO.c: Describe the use of target capital structure in estimating WACC, and calculate and interpret target capital structure weights.

When conducting an analysis if we know the company's target capital structure, then we should use it in our analysis. However, analysts typically do not know a company's target capital structure. It can be estimated using one of these methods:

1. Assume the company's current capital structure, at market value weights for the components, represents the company's target capital structure.
2. Examine trends in the company's capital structure or statements by management regarding capital structure policy to infer the target capital structure.
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LO.d: Explain factors affecting capital structure decisions.

- Capital structure policies and targets: Management and the board of directors often set guidelines to define reasonable credit limits for the company based on its risk appetite and capacity to sustain debt.
- Capital investment financing: Acquisitions or other major investments may present financing opportunities or requirements.
- Market conditions: Current share price levels and market interest rates for a company's debt; and
- Asymmetric information: The unequal distribution of information between management and other stakeholders.

LO.e: Describe competing stakeholder interests in capital structure decisions.

Management's capital structure decisions have varying effects on various stakeholder

groups. Conflicts of interest may arise when attempting to maximize shareholder wealth, in which one or more groups are favored at the expense of others.