BASIC CORPORATE FINANCE

THREE PARTS

- Financial forecasting
    - Short-run forecasting
    - General dynamics; sustainable growth
- Capital structure
    - MM
    - Static trade-off: Tax shield vs. Expected distress costs
    - Pecking order
    - An integrative approach
- Valuation
    - FCF
    - APV
    - WACC
    - Valuing companies

CONCLUSIONS

- The bulk of the value is created on the LHS by making good investment decisions
- You can destroy a lot of value by mis-managing your RHS
- Financial policy should be supporting your business strategy
- You cannot make sound financial decisions without knowing the implications for the business
- Finance is too serious to leave it to finance people
- Making sound business decisions requires valuing them
- This involves knowing the business (to make appropriate cash flow forecasts and scenario analysis, etc.)
- Valuation exercises can indicate key value levers

FINANCIAL FORECASTING

Four Steps

1. Forecast Assets
    a. Assumptions
2. Forecast Liabilities and Net Worth, leaving out the liabilities you want to remain free (e.g. Bank Debt)
    a. Assumptions
3. Use the difference as the “Plug” for the funding need (e.g. Bank Debt) and compute the implied Net Income
4. Use the implied Net Income to compute the implied Net Worth and plug back into Step 2 until you converge.

General Dynamics and Sustainable Growth

- The sustainable growth rate is g* = (1-d) x ROE
    - D = dividend
    - ROE = Return on Equity
- The sustainable growth rate g* = (1-d) x (NI/Sales) x (Sales/Assets) x (Assets/NW)
- Sustainable growth rate increases as
    - Dividends decrease (more reinvestment in the firm)
    - Profit margins increase (NI/Sales)
    - Asset turnover increases (Sales/Assets)

- Leverage increases (Assets/NW)
- If a company grows faster than g* without issuing equity, its leverage will increase
- If a company grows slower than g* without buying back equity, its leverage will decrease
- The sustainable growth rate does not tell you whether growth is good or not; EVA or DCF is necessary for that
- Financial and business strategies cannot be set independently (too few degrees of freedom) – e.g. Citibank
- Sustainable growth is relevant only if you cannot will not raise equity, **and** you cannot let your D/E ratio increase
- Sustainable growth gives a quick idea of general dynamics
  - Cash cows (g<g*)
  - Finance junkies (g>g*)

CAPITAL STRUCTURE

Modigliani-Miller Theorem

- In frictionless markets, financial policy is irrelevant
  - Financial transactions are NPV = 0 (i.e. no arbitrage) → QED
  - Corollary: Capital structure, long- vs. short-term debt, dividend policy, risk management are all irrelevant to firm value
- MM helps us avoid fallacies:
  - WACC fallacy
    - It is true that since debt is safer than equity, investors demand a lower return for holding debt than for holding equity
    - It is false that companies should always finance themselves with debt because they have to give away less return to investors
      - False: WACC unchanged → return on debt climbs with its risk
  - EPS fallacy
    - It is true that EPS can go up (or down) when a company increases its leverage
    - It is false that companies should choose their financial policy to maximize their EPS
      - Stock price will be unchanged since we will discount higher EPS flows at a higher rate (due to the increased risk) of leverage
  - Win-Win fallacy
    - It is true that investors differ in their preferences and needs, and thus want different cash flow streams
    - It is false that the sum of what all investors will pay is greater if the firm issues different securities (e.g. debt and equity) tailored for different clienteles of investors
      - Prices adjust so that the net value of these issues is unchanged
- Guidance for systematic exploration of "frictions"
  - Taxes
  - Costs of financial distress
  - Information asymmetry
  - Agency problems

Tax Shield of Debt

- Debt increases firm value by reducing the corporate tax bill
  - **If lots of cash, use (D-Cash), i.e. the Net Debt**
  - Interest payments are tax deductible
  - Personal taxes tend to reduce but not offset this effect

V(w/debt) = V(all equity) + PV(tax shield)

- PV(tax shield)
  - If debt level constant at D → tD
  - If leverage ratio D/V is constant → $tk_D D/k_A$

Other Motivations for Debt

- Free Cash Flow problem:
  - Too much cash relative to good investment opportunities
  - Management might misallocate funds, e.g. expanding into unrelated businesses
  - Debt is a way to pump cash out of the firm
  - Imposes discipline
- Litigation risk:
  - Debt is a way to get funds out before the plaintiffs can get it

Costs of Financial Distress

- Direct and indirect costs → reduces the size of the pie, i.e. the value of the firm
- Direct costs of bankruptcy:
  - Legal and administrative costs, fees, etc.
  - Usually too small, especially expected costs
- Indirect costs of financial distress:
  - Debt overhang → inability to raise funds
    - Benefits of raising equity if in distress go to the creditors first
    - Pass up valuable projects
    - Competitors become aggressive
  - Risk-taking behavior → equity holders only benefit if the company continues
  - Scare off customers and suppliers (e.g. Boeing and subsequent market for specialized parts)

Checklist for Target Capital Structure ***

- Taxes
  - How much does the company benefit from debt tax shield?
- Expected distress costs = Probability of Distress x Distress Costs:
  - Volatility of cash flow (industry or technological change, macroeconomic shocks, etc.)
  - Need for external funds for investment
  - Competitive threat if pinched for cash
  - Customers and suppliers care about distress (e.g. implicit warranty or specific investment)
  - Specific assets that are difficult to re-deploy or sell
  - Debt structure
    - # of creditors
    - Complexity of debt (e.g. Massey)

Pecking Order

- Applicable to companies that are mature and/or already public
- See Wilson Lumber case
- Firm's general financing choices, in order of preference:
  - Retained earnings
  - Debt borrowing
  - Issue equity
- Theory: Information asymmetry between the firm and the market means that external finance is more costly than internal funds
  - Management and external capital providers have different information sets

    - Debt less sensitive to information since it has a priority in payment
    - Issuing equity may signal the market that management thinks the stock is overvalued
- Implications for investment:
    - Project value depends on financing
    - Some projects will be undertaken only if funded internally or with relatively safe debt but not with equity
    - Companies with less cash and more leverage will be more prone to under-invest
    - Rationale for hoarding cash
- Implications for capital structure:
    - If a firm follows the pecking order, its leverage ratio results from a series of incremental decisions, not an attempt to reach a target
        - High cash-flow → Leverage ratio decreases
        - Low cash-flow → Leverage ratio increases
    - There may be good and bad times to issue equity depending on the degree of information asymmetry
    - Rationale for hybrid instruments (e.g. convertible debt)
- Pecking order is a descriptive theory, not a prescriptive one
    - Financing choices by firms
    - Explains finance junkies' high leverage (e.g. Massey)
    - Does not explain cash cows' low leverage → more likely "agency" (e.g. Intel)
- If firms use Pecking order blindly and ignore static trade-off (i.e. debt tax-shield vs. expected costs of financial distress), then:
    - Cash cows will end up with too little leverage (e.g. UST)
        - Good news: It's never too late to lever up
    - Finance junkies will end up with too much leverage (e.g. Massey)
        - Bad news: It can be too late to unlever (debt overhand)
        - Short-term debt is temporary relief but worsens things in time

An Integrative Approach

- Establish long-run "target" capital structure
- Evaluate the true economic costs of issuing equity
    - What is the real cost of the price hit vs. foregone investment or increase in expected cost of distress vs. foregone investment?
- If the firm is still reluctant to issue equity, then identify and address the problems:
    - Information asymmetry: Issue information, thereby undoing the information asymmetry
    - Market environment: Will the cost be lower if you issue later?
    - Structure: Use hybrids and packages to get there? Be careful. Recall MCI got stuck with debt when conversions didn't happen

VALUATION

General

1. Estimate the FCF
2. Compute an appropriate discount rate using either APV or WACC
3. Calculate the Terminal Value
4. Discount the cash flow to arrive at a PV

Estimating the FCF

- Free cash flows are the **expected** after-tax cash flows that the firm would generate if it were 100% equity financed
- Equivalent expressions:

FCF = EBIT x (1-t) + Depreciation – CAPX - ∆Net Working Capital

FCF = EBITD x (1-t) + (t x Depreciation) – CAPX - ∆Net Working Capital

FCF = EBIT x (1-t) - ∆Net Assets

- Recall the following accounting identities:

Net Working Capital = A/R + Inventory – A/P

Net Assets = Assets – A/P

Assets = PPE + Net Working Capital

CAPX = ∆PPE + Depreciation

- Note that in the restrictive case in which non-cash items have been deducted in the calculation of EBIT, we must add them back
- FCF is an economic measure of cash flow; EBIT x (1-t) is an accounting measure of cash flow
- Formulas need to be adapted in particular situations (know the economics – e.g. Southland)
- Use incremental cash flows:
    - Ignore sunk costs
    - Count opportunity costs
    - Avoid "accounting illusions"
- Since we will be discounting these cash flows, we do not need to re-include the interest payments
- **Must not forget the FCF at the end of the project's life: Terminal Value**
    - If liquidated → Salvage Value x (1-t) + t x PPE
    - Even if not liquidated, recoup Working Capital at least
- FCF ignores the tax shield provided by the firm's debt → this is taken care of separately in the APV or WACC calculation (otherwise double counting)

APV – Two Steps

1. Value as if 100% equity

    - Identify comparables (i.e. publicly traded **pure plays** in the same business)
    - Unlever each comparable's β_E to estimate its β_A using

        $\beta_A = \beta_E$ x E / (E+D)

        - We need to unlever because comparables may have themselves a leveraged capital structure; unlevering allows us to factor our financial risk of the competitors
        - Use the market value of equity in unlevering betas (market value from P/E and NI)
        - Equity in a firm with debt is riskier than equity in a firm without debt because debt receives some of the safe cash flows
        - This has nothing to do with the costs of financial distress

    - Okay if the comparable's D is not too high
        - In this case, we are assuming that

            β_D x D / (E+D) ~ 0 if leverage is low

Safe β_D is around 0.20
Safe D/(E+D) is around 0.20
Product is around 0.04 – negligible and so we can ignore it

- Use the comparables' β_A to estimate the project's β_A (e.g. average)
- Use the estimated β_A to calculate the all-equity cost of capital k_A

$$\mathbf{k_A = r_f + \beta_A \times (Market\ Risk\ Premium)}$$

- The risk-free rate is generally taken to be the long-term government bond rate, or the long-term government bond rate less 1%
- The market risk premium is generally assume to be 8%
- Use k_A to discount the project's Free Cash Flow

2. Add PV(Tax Shield)

- If D is constant over time, then PV(Tax Shield) = tD
- If D/V is constant over time (i.e. constant leverage), then PV(Tax Shield) = tDk_D/k_A
  - There is systematic risk in the debt tax shield if D/V is constant, therefore discount at k_A
- **Use the marginal (as opposed to the average) tax rate**

Weighted Average Cost of Capital

- Approach:
  - Adjust the discount rate to account for the tax shield

$$WACC = [k_D \times (1-t) \times D/(D+E)] + [k_E \times E/(D+E)]$$

- Debt worth D with expected return k_D (i.e. cost of debt) *if against that project only*
- Equity worth E with expected return k_E (i.e. cost of equity) *if against that project only*
- Marginal tax rate t *of the firm undertaking the project*
- Assumes that the firm undertaking the project has a constant D/V
- Conditions for WACC use:
  - If D/V is reasonably stable (otherwise use APV)
  - If debt is not too risky (otherwise use APV)
  - WACC is an attribute of the project, not the firm (e.g. GE has many WACC's)
  - Few companies have WACC that they can use for every project

WACC Cost of Debt Capital k_D

- Should be close to the rate that lenders would charge to finance the project with the chosen capital structure
- Not when debt is very risky
  - The cost of debt k_D is less than the coupon rate for highly leveraged firms
  - The expected return of the creditors on this debt is less than the coupon because they are factoring in the possibility of distress
  - **Do not use WAC for a highly leveraged firm**
- The target capital structure of a project/firm D/(D+E)
  - Want to count only the **incremental** tax shield
  - Get D/V from comparables, business plan, checklist, etc.
- Use the marginal tax rate t

WACC Cost of Equity Capital k_E Using CAPM

- We need the **levered** cost of equity
  - A firm that has leverage will have a riskier equity and therefore a higher cost of equity
- **Steps:**

1. Find the pure play comparables for the project under consideration
2. **Unlever** each comparables β_E (using the comparable's D/(D+E)), where E is the market value of equity for pure play comparables (P/E and NI → MV):

$$\beta_A = \beta_E \times E/(D+E)$$

3. Use the comparable's β_A to estimate the project's β_A (e.g. average)
4. **Relever** the project's estimated β_A (using the D/(D+E) of the project being valued), where D may have to come from the D/V of comparables

$$\beta_E = \beta_A \times (E+D) / E = (1 + D/E) \times \beta_A$$

5. Use the estimated β_E for the project to calculate the project's expected cost of equity k_E:

$$k_E = r_f + \beta_E \times (\text{Market Risk Premium})$$

- **These unlevering formulas are okay only if the comparable firm's debt is not too risky and its D/V is reasonably stable**

Terminal Values

- Three alternatives:
  - Liquidation
  - Growing perpetuity
  - Flat perpetuity

Liquidation Terminal Value (generally ignore)

$$TV = \text{Salvage Value} \times (1-t) + t \times PPE + \text{Working Capital}$$

- Want the after-tax salvage value
- Recover the working capital once project is discontinued
- Should be adjusted (e.g. if you cannot recoup all the A/R on your books, etc.)

Flat Perpetuity Terminal Value

- Assume that the company is in steady-state and that the company has a flat perpetuity equal to EBIT after tax, i.e. EBIT x (1-t)

$$TV = EBIT \times (1-t) / k$$

- Here k is either the WACC or the APV rate k_A

Growing Perpetuity Terminal Value

- Take EBIT and NA from the last year of forecast
- Assume that they grow at rate g
  - Problematic if g > Inflation Rate

$$TV = [(1+g) \times EBIT \times (1-t) - g \times NA] / (k-g)$$

$FCF_t = EBIT_t \times (1-t) - \Delta NA$

$(1+g) \times FCF_t = EBIT_t \times (1-t) \times (1+g) - (1+g) \times \Delta NA_t$

$\Delta NA_t = NA_t - NA_{t-1}$

$(1+g)\Delta NA_t = (1+g) \times NA_t - (1+g) \times NA_{t-1} = g \times NA_t$

$TV = FCF_t \times (1+g) / (k-g)$

- The replacement cost of assets in the steady state is -g x NA
- Assumes a linear relationship between EBIT and NA
    - Assumes that EBIT and NA are growing at the same rate in steady-state
- ***Don't forget to take the present value of the Terminal Value***
- Forecast horizon: company is reasonably stable afterwards

Economic Value Added

- Seeks to answer the question, "When is growth valuable?"
- It presents a static picture of the firm, rather than an idea of where the firm is going
- Growth is valuable when (approximately)

    EVA = EBIT x (1-t) – k x NA > 0

    Growth valuable when EBIT x (1-t)/NA > k

- Growth is good when the cost of scaling up (i.e. g x NA) is offset by the value of increased revenues (i.e. g x EBIT x (1-t) / k)
- Again assumes a linear relationship between EBIT and NA and that NA is an accurate measure of the marginal replacement cost
- EVA has nothing to do with sustainable growth
- Use EVA as a simple measure of whether a business is generating value and whether growth is enhancing value and as a way of setting goals to enhance value
- Problems with EVA:
    - Young companies (e.g. Internet, biotech)
    - Companies in rapidly changing business environments
    - Companies in which book values are not accurate measures of replacement costs

Multiples

- Assess the value of the project or the company based on that of publicly traded comparables
- Cash-flow based Value multiples:

    MV(firm)/Earnings, MV(firm)/EBITDA, MV(firm)/FCF

- Cash-flow based Price multiples:

    Price/Earnings, Price/EBITDA, Price/FCF

- Asset-based multiples:

    MV(firm)/BV(Assets), MV(equity)/BV(equity)

- Pros:
    - Incorporates simply a lot of information from other valuations
    - Embodies market consensus

    - Can provide discipline for DCF valuation: How do I explain the difference?
    - May be most relevant if you are immediately involved in what the market will pay, not the fundamental value
- Cons:
    - Hard to incorporate firm-specific information
    - Relies on accounting measures being comparable, too.

Other Factors in Valuation

- Liquidity
    - Especially important for private companies
    - Typical discount: 25%
    - Note: need to account for IPO plans
- Control:
    - With a controlling stake, can influence operations, implements synergies and capture (part of) their value
    - Also, entrepreneur might care about the “vision”
- Large individual shareholder (corporate):
    - Maybe very undiversified, at least for a while