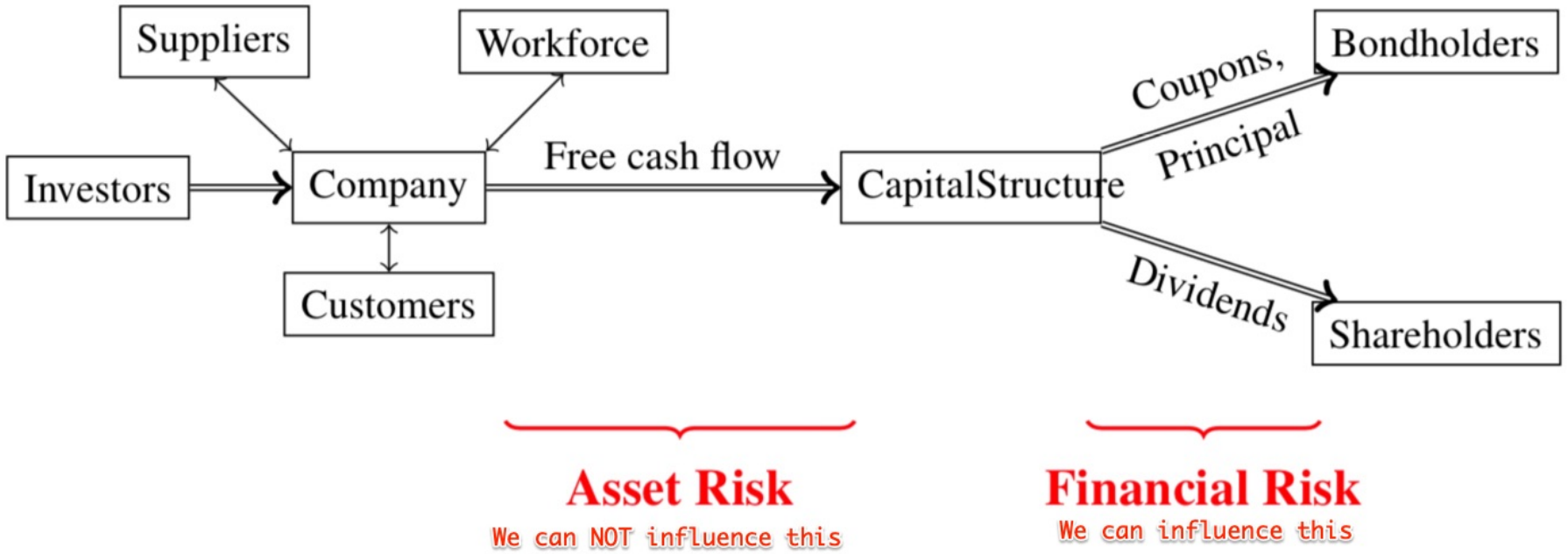
CORPORATE FINANCE

MFE

Jannes Klaas

MICHELMAS TERM



THE MOST IMPORTANT DIAGRAM IN THIS COURSE

COFIN PHILOSOPHY

Companies turn resources into other resources

Companies should do this in the most efficient way

Maximizing shareholder wealth provides good incentives for effective operation

There are "externalities", e.g. unvalued resources that get used such as clean air

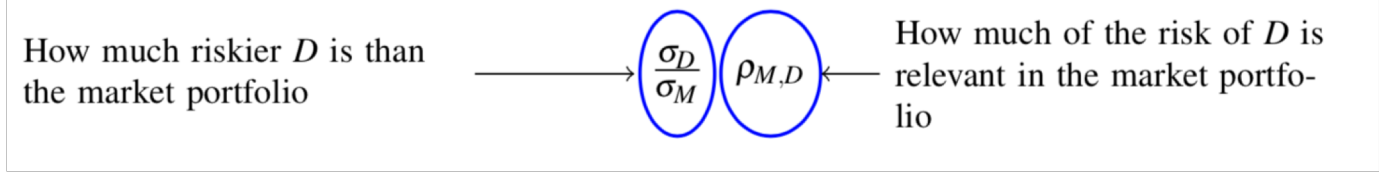
The government should strive to eliminate those

NET PRESENT VALUES

- Money is worth more now than it is in the future
- We need to discount future cashflows with the discount factor R
- A cashflow x in year n has an NPV of $\frac{x}{(1+R)^n}$
- A cashflow x paid in perpetuity has an NPV of $\frac{x}{R}$
- An annuity of x, paid until year n has an NPV of $\frac{x}{R} - \frac{x}{R}\frac{1}{(1+R)^n}$
- The frequency of compounding matters (semi annual, monthly, etc.)
- We often work with continuously compounding rates:
- $\lim_{f \to \infty} \left(\frac{1}{1+R/f}\right)^{Tf} = e^{-RT}$

CAPM

- What is the discount factor you ask? CAPM is one way to find out
- Securities lie on a 'Securities Market Line' in the risk/return space from risk free securities to the market portfolio and beyond
- Constructing a portfolio of assets we find an efficient frontier of optimal risk return tradeoffs
- If they are uncorrelated to other assets, it can make sense to invest in poorly performing assets
- We then draw a tangent line from the risk free asset to the efficient frontier
- The position on the line is determined by an assets 'beta'
- More in the asset pricing course

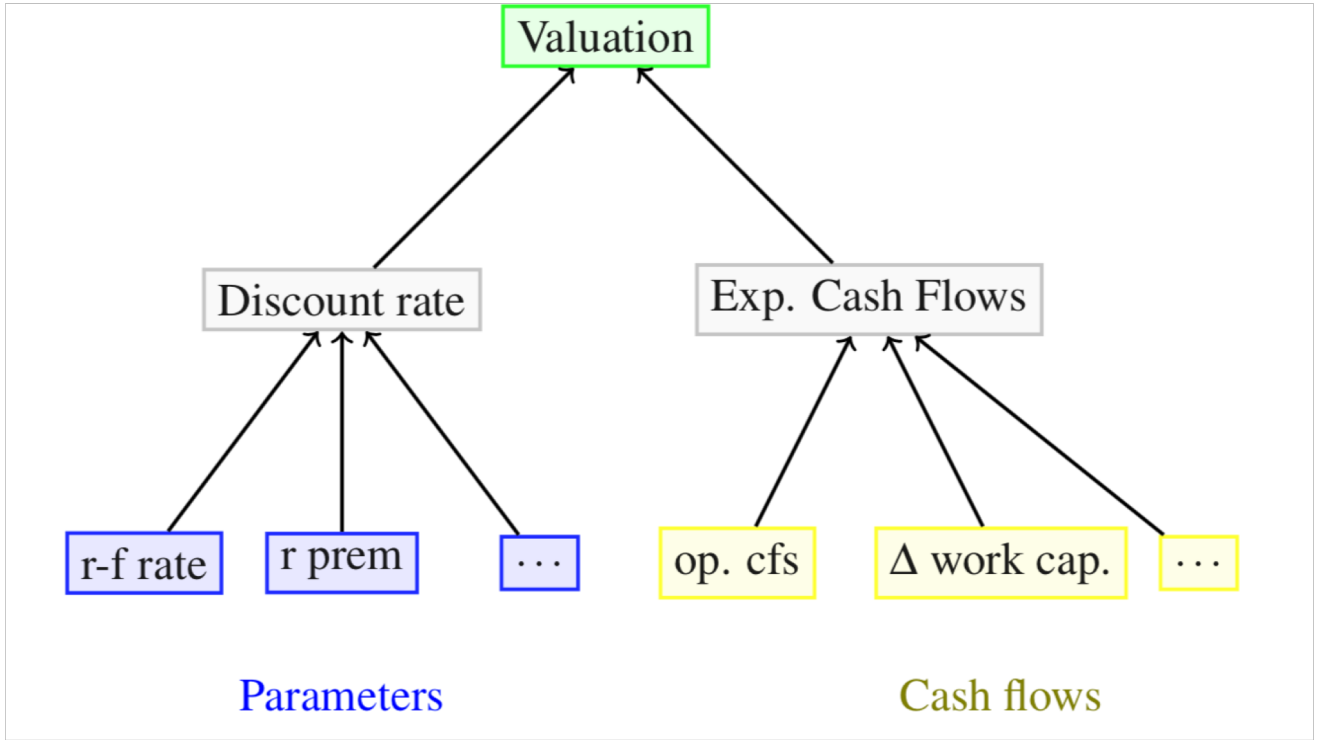


CERTAINTY EQUIVALENT CAPM

- Returns of a project are **not** based on required investment, but on estimated market value
- That makes plain CAPM hard to use
- CE CAPM adjusts the cashflow penalizing risk
- By expanding the project return $r_j = \frac{\mathbb{E}\{C\}}{PV\{C\}}$ we rearange CAPM to $PV\{C\} = \frac{\mathbb{E}\{C\} - \lambda Cov(C, r_M)}{1 + r_f}$

PARAMETER ESTIMATION

- CAPM is top down, it is often better to go bottom up
- Estimate cash flows, estimate discount rate, then calculate NPV



THE RISK FREE RATE

Usually T-Bills or T-Bonds, but there are multiple 'quasi risk free' assets

If currency frictions matter, choose a local rate

Or just knock off 1% of big corporate bond yields

CAPM assumes a static rf, but ofc it changes

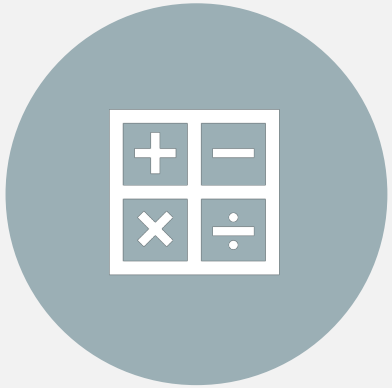
Depending on run time, 90 day T-Bills or 10 year T-Bonds are good reference points as they are frequently traded

If the project beta is far from 1, choice of rf has a big impact

RISK PREMIA

- CAPM assumes constant risk premia
- Ofc, nothing is constant, but they are predictable
- In practice, most people don't know they can predict premia based on macro factors
- Premia have a large country factor, which can be estimated separately
- US premia are often computed
- We can estimate a risk premium from the US premium times some scaling factor

ESTIMATING BETA



IN THEORY, LINEAR REGRESSION WOULD BE ENOUGH

BUT OUTLIERS AND SMALL DATA MAKE CALCULATIONS MORE COMPLICATED

SEVERAL PROVIDERS OFFER CANNED BETA ESTIMATES

COST OF DEBT

- CAPM also applies to debt
- The 'yield to maturity' (YTM) is the discount rate r that satisfies
- $b = \sum_{t=1}^{T} \frac{C_t}{(1+r)^t} + \frac{P}{(1+r)^T}$, b: bond price, C: coupon, P: principal, T: runtime
- No analytical solution, needs to be approximated numerically
- For bonds with a constant coupon, a simple YTM is sometimes used:
- $r_{SYTM} = \frac{C + \frac{P-b}{T}}{\frac{P+b}{2}}$

WHEN CAPM FAILS BONDHOLDERS

- Speculative bonds often don't have market risk but are risky because the company is in distress
- Pricing via CAPM leads to wacky prices
- In those cases, it is better to price the bond via the expected default probability δ and recovery rate ρ
- A simple adjustment can be computed via:
- $r_{YTM} - \mu_d = (1 + \delta)(1 - \rho)\delta$

ESTIMATING CASH FLOWS

Bottom up from business case

Restrict analysis to marginal (additional with project) cash flows

EBIT = Turnover – COGS

Working capital = Current Assets – Current Liabilities

FCF = EBIT(1 - TaxRate%) + Depreciation - CapEx - Ch in W/Cap

This cash flow calculation assumes all decisions are made **now**, real options assume delayed decisions

PAYBACK PERIOD APPROACH

How much time will this project take to repay itself?

When is the sum of cashflows larger than investment?

Interpolated payback: Allows for fractions of time periods (e.g. 2.5 cashflow payments will repay the project)

Discounted payback: Discounts future cashflows and estimates time until current value is received

INTERNAL RATE OF RETURN (IRR)

- Discount rate at which NPV is zero
- Accept projects when IRR is greater than the CoC
- $r_{IRR} = \sqrt[T]{\frac{CF_T}{Inv}} - 1$

PROBLEMS WITH IRR

- Assumes investors are 'lending' money to project which can produce strange semantics
- IRR assumes that cash thrown off from the project can be reinvested at the IRR rate
- It is very hard to compare projects using IRR
- When project cash flows change signs many times, the project can have many IRRs
- A solution to the multiple solutions problem is the 'Modified IRR' or IRR lite
- $r_{MIRR} = \sqrt[T]{\frac{FV(Inflows)}{PV(Outflows)}} - 1$
- To calculate future value (FV) and present value (PV) we now need to assume two rates

MULTIPLES

- Some ratio fanatics use a modified version of NPV, the profitability index
- $PI = \frac{PV(Inflows)}{PV(Outflows)}$
- Easy way to compare projects
- Maximizing PI leads to high margin but low total profit projects and should be avoided
- Others use the earnings multiple m
- $m = \frac{Firm\ Value}{EBITDA}$
- Only accept projects whose multiples are above firm multiple
- Multiples are easy to compute but sometimes have shaky theory behind them and can be calculated on the wrong basis, leading to poor outcomes

TERMINAL VALUES

- Cash flow forecasting is hard, so most analysists only forecast CFs for a few years and calculate a terminal value from then
- One way is by through **earnings multiples**
- The other is **Gordon Growth**
- Assumes a constant growth rate g for cashflows and values
- $V_t = \frac{(1+g)C_t+(1+g)V_t}{1+r}$
- g can not exceed growth rate of economy in the long run (or firm would run everything long term)

ECONOMIC VALUE ADDED

- An *ex post* valuation metric, often used for compensation
- $EV_t = CF_t - AccDep_t - r * BookValueOfInvestment_{t-1}$
- AccDep = Accounting depreciation
- $CF_t - AccDep_t$ = Net Operating Profit After Taxes (NOPAT)
- EVA of a project is a sequence
- EVA of a positive NPV project need not be positive in every year of the project's life and vice versa
- The PV of the EVA of a project equals the project's realized NPV
- Compensating a manager with rewards proportional to EVA will lead her to make value maximizing project choices
- BUT assumptions are not realistic

ESTIMATE COC FROM MARKET VALUES

- If we assume dividends with a constant growth rate, we can estimate the firms CoC (discount factor) by solving:
- $P = \frac{CF_1}{r-g}$, CF: Cashflow in first period, r: CoC, g: growth rate, P: Market price
- Growth can be estimated from retained earnings RE over equity I times return on equity
- $g = \frac{RE_{t-1}}{I_{t-1}} * ROE$=Retention Ratio * ROE
- The Present Value of Growth Opportunities (PVGO) is the sum of dividend yield and growth rate

P/E RATIOS

- Analysts calculate a *forward PE ratio*, a forecasted PE, which can be derived from Gordon Growth
- $\frac{P_0}{E_1} = \frac{{}^{D_1}/_{E_1}}{r_E - g} = \frac{Dividend\ Payout\ Ratio}{r_E - g}$

MILLER AND MODIGLIANI

- Assuming no arbitrage, no taxes, no transaction costs, no distress costs…
- Capital structure does not influence firm value
- Corporate cost of capital is independent of the capital structure
- Investors can use *home made leverage* to lever or de-lever the firm
  - E.g. buying unlevered stock using debt
- If capital structure would influence firm value, investors could use home made leverage for arbitrage
- Since this is a no arbitrage argument, arbitrage should be impossible
- Raising debt means that shareholders demand a higher return. The average does not change, and you don't get a free lunch

SAVING MM FROM THE TAXMAN

- The MM proposition (that financial structure does not influence firm value) originally assumes no taxes
- Since a tax shield has value, that argument is in trouble
- Miller however argued that investors also pay income tax, and thus might be indifferent to their corporation or themselves paying tax
- In equilibrium, the marginal borrower derives no tax advantage from issuing debt rather than equity. Otherwise, they'd issue debt until debt prices rise and they are indifferent again
- *Aggregate* corporate structure is determined in equilibrium by tax effects, but *decisions at the corporate level are irrelevant*

THE DEBT TAX SHIELD

Interest expenses are expenses that reduce taxable profit. Leverage lowers taxes

Thus, a levered firm is worth more since its cash flows are higher

The limit to leverage is financial distress costs. Bankruptcies are expensive

The optimal leverage lies at the optimum between maximizing the tax shield and minimizing distress costs

WACC WEIGHTED AVERAGE COST OF CAPITAL

- $r_{WACC} = (1 - L)r_E + L(1 - \tau)r_D$, L: Leverage ratio, τ: Tax rate, r_E: Cost of equity, r_D: Cost of debt
- $L(1 - \tau)r_D$ is the true cost of debt, after subtracting tax benefits
- Main assumption: Constant debt ratio
- Can be derived from DCF (next slides)

DERIVING WACC: r_U, r_L, r_{WACC}

- $V_{L,t} = \frac{\mathbb{E}[GCF_{t+1} + V_{L,t+1}]}{1+r_L}$, $V_{L,t}$: value of levered firm, GCF_{t+1}: gross cash flow (before interest payments), r_L: levered firm discount rate
- $V_{U,t} = \frac{\mathbb{E}[C_{t+1} + V_{U,t+1}]}{1+r_U}$, $V_{U,t}$: Value of unlevered firm, C_{t+1}: Cashflow (after tax), r_U: Unlevered firm discount rate
- $V_{L,t} = \frac{\mathbb{E}[C_{t+1} + V_{L,t+1}]}{1+r_{WACC}}$, $V_{L,t}$: value of levered firm, C_{t+1}: Cashflow (after tax), r_{WACC}: WACC rate

DERIVING WACC: THE UNLEVERED FIRM

- Assuming constant growth, the value of the unlevered firm is a multiple of it's current cash flows (Gordon Growth Model)
- $V_{U,t} = mC_t$
- This multiplier is effectively $\frac{1}{r-g}$
- This ignores the technical issues and working capital considerations involved in equating EBITDA with cash flows, but is fine for a model

DERIVING WACC: THE TAX SHIELD

- The main difference between levered and unlevered firm is the tax shield
- $TS_t = \tau r_D D_t$, TS: Value of tax shield, τ: Tax rate, r_D: Discount factor, D_t: Amount of debt ($LV_{L,t}$)
- **The discount rate for the tax shield r_D should be the same as the discount rate for unlevered firm.** This is a key assumption for WACC
- The WACC is best understood as an adjustment to the firm's levered cost of capital *rL* to account for the value of the debt tax shield.
- The WACC is not the required rate of return

WACC DISCUSSION

- …applies tax effects in a very stylized fashion
- …ignores personal tax effects of investors
- …ignores distress costs
- …assumes a constant leverage policy
- …assumes constant growth
- BUT, breaking these assumptions does not usually lead to different decisions. WACC is not a pricing tool but a decision making tool and as such it often works very well
- The assumptions should not be ignored and for some more specialized problems there are more specialized tools

MILES–EZZELL WACC

- Relaxes the constant debt and cost of capital assumptions of WACC
- Still requires constant growth
- Constant growth leads to constant discount rates, so the gains are not as big as it might seem
- $r_{WACC:ME} = r_U - \tau r_D L \frac{1+r_U}{1+r_D}$

APV

- Alternative to WACC which values tax shield directly and separately
- The NPV of the project's cash flows discounted at the unlevered cost of capital
- Tax shield discounted at its own rate
- Cleaner and more flexible than WACC
- BUT Predicting the quantity of debt and finding a discount factor is not always easy
- The APV approach extends to all kinds of other 'extras' such as subsidies

DE-LEVERING BETA

- For WACC & APV we need to find good discount rates
- These are usually found from **comparables**
- But the comparable firm might be levered differently, so we need to delever and then relever to find the right beta
- The beta of the levered firm is a weighted average of its debt and equity
- Thus, under the constant debt *ratio* policy
- $\beta_E = \beta_U \frac{1}{1-L}$
- Under a constant debt level policy, debt does not change value so its beta is zero. We need to adjust for that:
- $\beta_E = \beta_U \frac{1-\tau L_k}{1-L_k}$

CF2EQT

- Value cash flows to equity directly
- Values tax shield *implicitly*
- If new investment does not affect existing debt's value, and securities are correctly priced a competitive market, NPV and Cash flow to equity produce the same accept reject decisions.
- Can be hard to forecast cashflows, mostly used when there is only one CF at the end of the investment (e.g. selling the investment)
- In those cases, CF2EQT is simply easier than a DCF NPV
- Once cash flows are forecasted, we can use other tools like IRR for hurdle rates

COST OF BANKRUPTCY

- Financial distress is why firms don't lever more
- Weiss (JFE 2000) found that in default, on average 20% of equity and around 3% of total asset value is lost
- Andrade and Kaplan (JF, 1998) find about 10-20% of total asset value lost
- It is hard to separate financial and economic distress, in some cases, financial default might be economically beneficial
- It is generally accepted that default costs, perhaps up to 20% of assets
- This suggests that firms would find an optimal tradeoff between tax shield and bankruptcy cost
- Firms that with lower bankruptcy costs (e.g. through liquid assets) should be levered more
- In reality, firms issue less debt than tradeoff theory would suggest & debt precedes taxation

LEASE VS BUY

Leasing allows to replace one large cash outflow with several leasing payments

Assuming the company runs a constant debt level policy, that large outflow would be partially debt, thus providing a tax shield

The value of the lost tax shield depends on the price of the lease, which in turn depends on the value of the lost tax shield, chicken and egg!

The course focuses on financial leases, not operational leases

CLASSIC MYERS, DILL, AND BAUTISTA (MDB) SOLUTION

- Treat lease and debt obligations equally
- Assumes the lease is a financial lease and tax benefits can be fully used
- The relative cost of leasing c_0 per $ of asset value is:
- $c_0 = \sum_{s=1}^{H} \frac{(1-\tau)p_s+\tau b_s}{(1+(1-\tau)r_D)^s}$, H:Lease period,τ: tax rate, p_s: lease rate, b_s: depreciation charge, r_D: Cost of debt
- Intuitively: The after tax cost of lease payment plus the cost of (lost) depreciation tax benefits over the after tax cost of debt
- Lease if $c_0 < 1$

MDB'S SHORTCOMINGS AND SOLUTIONS

- Leases have more optionality than debt
  - Need real options to value this
- Leases are treated different in default
  - The value difference too small to be considered significant
- Tax shields are not always fully usable because of insufficient taxable income
  - Needs customization (next slide)

CUSTOMIZING MDB

- A company can not always use tax shields but it can often carry them forward (use them later)
- We first value the lease **from the time at which the tax shield can be used**
- We subtract the accrued carry forward tax shield
- Our cost calculation is now missing is the (lost) interest cost of carrying forward the tax shield, we compute this by subtracting payments made from present value of payments made. Both include the interest cost, so we need to solve the equation
- Finally we add up the present value of all payments as well as the tax value of interest cash flows to arrive at the final cost

WHY REAL OPTIONS

- In many projects…
- …*optionality* i.e. delaying decisions is a large value driver
- …*operating leverage* is a large value driver
- Thus discounted cashflows would largely undervalue the project
- It is much better to value a project as an option
- E.g. a startup usually only requires large investments once market conditions are better known. Not valuing that payments are made only under favorable conditions would undervalue the startup

REAL OPTIONS PRINCIPLES

- *No Gestalt in valuation:* The value of the whole project equals the sum of its component cash flows
- *Nothing in a name:* the value of the component cash flows does not depend on who owns them. (e.g., riskless bond issued by Google will have the same price as riskless bond issued by Microsoft)
- *The present value of the future is its current price:* The present value of payoffs from an asset equals the asset's current market price
- (3) means that commodities received in the future don't need to be discounted, their price already includes the discount

REAL OPTIONS PRINCIPLES II

- Assets with the same payoff must have the same price
- All assets are a combination of Arrow securities
- The risk free rate equals the sum of state prices
- State prices p can be solved from prices & payoffs of securities
- The value of a delayed decision is then:
- $NPV = p_u CF_u + p_d CF_d$
- State prices scaled to sum to 1 are risk-neutral-probabilities Q
- Thus risk neutral pricing is given as
- $v = \frac{\mathbb{E}_Q[CF_u]}{1+r_f}$
- We can replace Q with other probabilities that include risk

SIMPLE & FANCY SHOEHORN

- In most projects there are more than two outcomes
- Using BSM allows valuing a more complex project
- Need to "shoehorn" project into BSM formula
- Simple shoehorning: Find a "tracking asset" that is linked to project success and price asset as a European call on that tracking asset
  - Either with BSM or Binominal Options
  - Popular with commodities
- Fancy shoehorning: Add bells and whistles: Either price as option on exchange on assets or as a compound option. More options possible

SIMULATIONS

- Obtain asset movement probabilities which are consistent with BSM
- Define payoff profile as a function of asset price
- Run a Monte Carlo simulation to obtain a wide range of possible outcomes
- Value by discounting average outcome with risk free rate
- Much more flexible, allows for valuations which are not possible analytically

HILLARY TERM

MECHANISM DESIGN 101

- ”Inverse Game Theory”, design incentives for optimum outcome
- Principal commits to some mechanism y()
- Agent observes true state θ and reports $\hat{\theta}$
- Response is implemented according to y($\hat{\theta}$)
- If there is an optimal Nash equilibrium, there is also one in which the agent is truthful $\theta = \hat{\theta}$
- The goal is to design y() so that there is a Nash equilibrium with good outcome
- First step is to define **first best solution** (if everything was known)
- From there we can derive **second best solution** (if θ was unknown)
- And eventually the **third best solution** (if the state of the world was also unknown)

COSTLY STATE VERIFICATIONS

- Securities are promises of payment depending on the state of the firm
- In principle many forms possible but usually it is equity or debt
- Issuing a security requires some sort of **witness**
- Managing the security requires **state verification**
- **State verification is costly**
- This influences choice of **optimal security**
- **Debt** generally has the lowest verification costs
- Both auditing and liquidation costs are "leakage" that is minimized

THE REVELATION PRINCIPLE

- Fundamental theorem that **every mechanism that has an equilibrium also has an equilibrium in which all players truthfully report their type**
- E.g. if there is an equilibrium in which all entrepreneurs lie and all investors expect them to lie then there is also an equilibrium in which nobody lies
- This greatly simplifies analysis as we can always assume everyone reports their type truthfully

STAGED FINANCING

- Financing done in multiple rounds
- By signing up for it, entrepreneur signals confidence to be in a good position in a few years
- Aligns incentives, entrepreneur can not divert cash because that would hurt in the next financing round
- Many variants of **dynamic contracting**
- Downside: Bad luck might leave the entrepreneur penniless even if she did everything right
- If the entrepreneur does not go bankrupt, she becomes extremely rich

ASYMETRIC INFORMATION

- Markets are weakly efficient, they (more or less) reflect all publicly available information
- If they don't have information about a company they must assume the worst, **disclosure is important**
- In a **lemons market** bad firms crowd out the good ones (adverse selection)
- So good firms need to **signal** that they are good
- Issuing securities always reveals the insider view, issuing **equity is a bad signal**
- Alternatively, firms might accumulate **slack** (excess cash not paid back to investors)
- This means they can avoid financial markets for a while

PECKING ORDER

Issuing debt is the best because it contains a good signal

If you can't issue debt you issue equity which is a bad signal

There are a few exceptions in which equity is a good idea

But it is still a bad signal

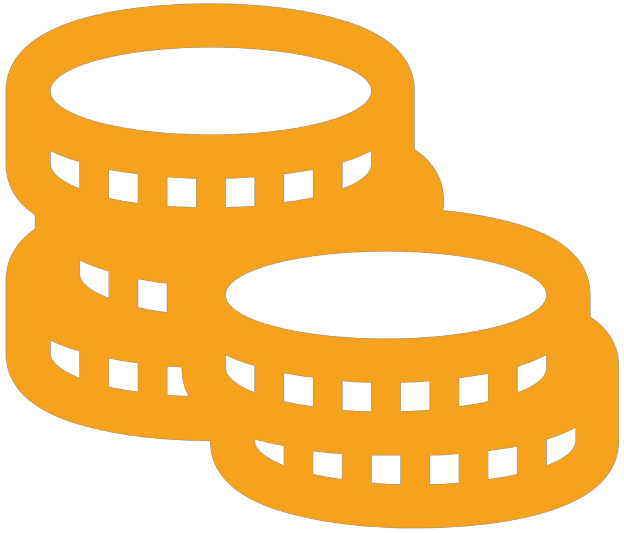
Misvaluation leads firms to **underinvest**

Management is incentivized to issue the worst security

Investors know this and undervalue firms

COMPENSATION

- Objectives: Attract the best, induce them to perform
- Means: Base pay (cash) + performance bonus (options, stock, etc.)
- Hurdles: Many legal regulations about what you can pay
- Problem: Effort does not directly translate to success, there is noise so that shirking managers are sometimes successful and hard working ones sometimes fail. **Effort is unobservable**
- **Performance pay must be minimum amount under which it is optimal for manager to work hard**
- Managers can extract managerial rents because principal can't observe effort
- Competition for CEOs: firms have to pay high base pay and performance incentive **on top**



COMPENSATION II

- **Tournament based incentives**
- Make everyone compete for price (e.g. CEO job)
- Price must me very enticing (CEO earns a lot of underserved com)
- Only fair if noise is correlated

- **Positive assertive matching**
- Better firms benefit more from better people
- Thus better firms can pay more
- Best people end up at best firms and worst people at worst firms

OPTIMAL CAPITAL STRUCTURE

- **Tax shields** and **bankruptcy** cost drive the value of a capital structure
- The goal is the take on as much debt (and thus tax shields) as possible without letting the risk of bankruptcy (and thus bankruptcy cost) go too high
- Leland model computes value under these assumptions
- **Leland Boundaries**: **Lower bound:** At the bankruptcy point, debt value equals asset value less bankruptcy costs
- **Upper bound**: As the value of the unlevered firm grows without limit, the value of the debt approaches its perpetuity value

PICKING A BANKRUPTCY POINT

EQUITY HOLDERS DECIDE ON BANKRUPTCY

THEY PICK THE POINT THAT MAXIMIZES THE VALUE OF THEIR EQUITY

THEY DON'T KNOW "IF THINGS WILL GET BETTER" SO THEY CAN'T ACTUALLY PICK THE OPTIMUM POINT AND WILL USUALLY EXERCISE TOO EARLY

DEBT HOLDERS PAY THE BANKRUPTCY COST

SO THEY ARE INTERESTED IN EQUITY HOLDERS NOT DECLARING BANKRUPTCY

WHICH HAPPENS IF EQUITY VALUE IS HIGH: SOMETIMES THAT IS WHEN VOLATILITY IS HIGH

ADJUSTMENT TO CAPITAL STRUCTURE

As asset values fluctuate, firms need to adjust their capital structure to meet optimal rates again

This is costly so they are slow

Empirical puzzle if there was a recent adjustment, adjustments become *more likely*

Firms seem to roughly balance their tax shield / bankruptcy cost but might also follow other objectives

BANKS AND LOANS

Mostly smaller firms lend from banks

Securing a loan has a positive stock price effect

Banks provide monitoring that allows them to lend to smaller firms with no big audits

They bundle the investments of other investors and bring overall monitoring costs down

Bank also risk pools so that monitoring the bank becomes easier

The cost for this is paid by the borrower, so that large, trusted firms don't need it

Banks provide a **certification** and **commitment device**

Banks not always incentivized to do their job properly though…

BANKING STABILITY

- Because of their importance to the systems, banks must be stable
- But banks have no incentive to be stable
- If their asset appreciate, they will take on more debt
- So only regulation keeps them from fragility
- Key theme of regulation: Mandatory reserves
- Double equilibrium in which banks are either solvent and there are qualified buyers for assets or one in which banks go down and qualified buyers have no money -> Fire sale
- This is how financial crisis happen

ACTIVISM

- Activist investors buy a controlling stake, improve the firm, and make a profit through the improvement
- Small investors, whose decision does not matter in the activist acquiring the stake, have no reason to sell below the price of the improved firm
- Thus, most value of the takeover goes to existing shareholders
- Activists need to acquire a stake in secret
- Only liquid markets allow this
- Large block shareholders are different and might sell earlier to make the merger happen

STOCKS AND INFORMATION

- Informed trades make stock prices informative and can thus guide management decisions
- For stocks to be informative, the need to be sufficiently liquid so that trading in them makes sense
- Firms can design their securities in a way that informed traders can benefit more easily so that prices contain more information
- E.g. adding a risk free component increases the price a trader needs to pay, thus informed traders can buy less
- Making it easier for investors to get information makes prices more informative

BANKRUPTCY

- **Illiquid** = Just lacking cash
- **Insolvent** = More debt than assets
- **Economic Failure** = Value maximized by dissolving
- Information asymmetry, unverifiable cashflows, free rider problems and creditor conflicts make bankruptcies messy and costly
- **Creditor friendly: Pro**: Increase debt capacity, firms incentivized to avoid distress, **Con**: Excessive liquidation & underinvestment
- **Debtor Friendly: Pro**: Fewer inefficient liquidations and underinvestment **Con**: Harder to borrow, little incentive to avoid bankruptcy
- Differences in systems around debtor protection, trigger rules etc.

ALTERNATIVE DEBT DESIGNS

- Shareholders and creditors have a conflict of interest
- Alignment problem can be solved if creditor has some equity or reputation stake
- Field of mechanism design fiends strategies, key idea is revelation principle
- **General Game**: Both debtor and creditor make deposits into account, creditor observes deposits by debtor and responds accoardingly
- **Universal Game**: Debtor requests loan, both debtor and creditor report state of the world, based on the similarities and differences the creditor decides
- The universal game can mimic the general game
- Universal game can be solved numerically and generate optimal debt contract

MERGERS AND ACQUISITIONS

Outside acquirer buys controlling stake to make improvement, merge with other firm, split up firm, etc.

Usually more potential acquirers than potential targets: An auction is held

Acquirer premium dependent on acquiring secret "toehold"

Large block stakeholders usually willing to make concessions because the acquisition will only happen with them

Negotiated mergers still allocate bulk of profit to target: Negotiations happen under threat of tender

The winner of the auction likely overpaid (everyone else valued it at less) **winners curse**

1

Stock or cash, stock signals acquirer believes stock is overvalued

2

Stock exchange will only be accepted if target has positive private information

3

Hubris or stock overvaluation can be reason for acquisition in first place

PAYMENT METHODS

BOARDS

- Boards act as "watchdogs" making sure management doesn't burn shareholder money
- Comprised of insiders and outsiders
- Especially outsiders (in theory) are good watchdogs, become more prevalent
- Outside board members usually sit on many boards
- Boards also protect management from opportunistic shareholders

THANKS FOR READING

And good luck