ENGR 111 Notes

W 1 M Lec 1-9-17
melike@seas.ucla.edu
Mon-Wed, 3-3:50 PM, Boelter Hall 6532AA

TAs: Kevin Landry kevintlandry@ucla.edu
Alex Wong alexw@cs.ucla.edu
Aysan Rangchian aysanrangchian@ucla.edu

Corporate Finance by Ross, Westerfield, Jaffe, 10th edition

- Each week, there will be a reading document
- This will get tested, so be sure to read them!

Need a simple calculator to do basic calculations!

https://ccle.ucla.edu/course/view/17W-ENGR111-1

Grading
Total of 8 Homeworks – 20%
Lowest dropped
Each about 3%
Group Project – 10%
Midterms – 20%
Final – 30%

<u>Midterms:</u>
Feb 1st, March 1st , in class.
Closed books and notes.
Formula Sheet will be provided.
You need to bring a calculator.

<u>Final:</u>
March 22nd, Wednesday, 3pm-6pm.
Closed books and notes.
Formula Sheet will be provided.
You need to bring a calculator.
If you have a conflict, wait for the email regarding an alternative date!!!

Group Project

- Get together (5-6 people) - everybody take a section and do get work, but disconnect it from the rest of the paper.
- Mel reads every group paper line-by-line.
- Read the entire thing before submitting the group paper. It needs to be cohesive!

Tuesday (Jan. 30) - review session with TAs

- Each day before the exam will be an exam review session!
- 1 side of a cheatsheet is allowed
- No numerical examples solved on the cheatsheet - just definitions, graphs, etc.
- NO SOLVED EXAMPLES!

85 > A
80-85 A-
75-80 B+
…

Extra points by participating in online polls and something you can connect to the Internet with

- YES! You will be tested on Current Event topics as long as it is mentioned in class

Current Events

- Volkswagen people got arrested after emissions report
- Bad for Volkswagen!
- In the long-run, it is probably good if they can make a turnaround.

Every lecture - there will be an online question and you will earn .25 extra points!

- Good to get!

Q. By what percentage would you improve the quality?
A. Scientifically, we know our products are better. Qualitative comparisons are NOT good enough!

Healthcare credit cards

- Doesn't it stink every time when you go to an office?
- You have to tell them everything you do, so you just carry this ID card and you just swipe the thing and you are done.
- How are you going to monetize?
- Selling the cards or you could get a piece of the profits off the insurance companies.
- They have to pay subscription fees to use the card.
- Do you want to pay for it out of pocket, whether this guy manages to get the insurance company to pay them or not?
- You have to start growing your user base, and when you have enough members, as a percentage, you could then have some subscription basis.
- Why don't you just put a name and DOB into a piece of software?
- How do you differentiate yourself? Is this technology easy to copy?
- How would you get a hospital to integrate your idea?
- Are you going to charge the hospital?

- It will probably go into saving lives.
- I thought the best investment strategy is to give them the software for free.
- Freemium model first and then charge for it later?
- Whenever there is a medical product, try to stay away from medical innovations
- Doing a better job than Sony in handling a ransomware attack.

The experience of buying used items

- Improving this experience and trying to take on craigslist
- All kinds of spam and look for things that are from the wrong category.
- Facebook groups have been used to do this, but it is a bit all over the place.
- People would NOT use Google Search if we had to pay for it!
- These customers are used to a system where they don't want to pay for anything
- Instant gratification

Uber - disrupting the Taxi industry in a snap

- Making it more efficient and it isn't a very complicated product in its idea
- The programming is hard but the core idea is very simple.

Course Topics

0. Accounting
   - Looking at a company's finances and start looking at the company's financial statements.
0. Go into understanding how the company makes money
   - We established the company and how are we going to select projects that make money.
0. Look at how to invest and look at the bond market as well as the stock market.
   - Do some portfolio analysis and come up with a good portfolio with the lowest possible risk.

- Understand what to invest on and look at the company from an investor's perspective and try to understand how to invest.

- Give accumulated knowledge in the finance industry, and it will obviously be important to know these things!
- If you start a company yourself, knowing about finance will help you a lot!
- A lot of emails from former students asking for advice and consulting!

- This is useful for personal finances!

W 1 W Lec 1-11-17

- Gigafactory in Nevada - check out things there

- Faraday is making people get more excited about electric cars.
- What is the biggest hurdle in front of electric cars?
- Range anxiety because they don't want to change the way they do things.
- Reserve the right to drive to Las Vegas whenever you want.
- With electric cars, you have to plan because it cannot go that far to Vegas.
- If there is anything happening that is working towards potentially increasing the size of the pie, that could be a good thing.
- Cost of how long things are waiting to get a product and a lot of other attributes of the product.
- The technical specs of Tesla seem to be better.
- Tesla isn't doing too well in China

Ch. 3 is numerical and deeply gets into the nuts and bolts
- HW 1 should be the easiest homework we will have.

Key Concepts and Skills
- Different business forms
- What is the goal of the company
- Understand the conflicts of interest that may arise
- The first thing that happens with tech companies is that an engineer with a great idea builds it
- 90% of the tech specs are useless to the consumer
- Investors are looking at you and are wondering how to monetize
- They can get rid of you or put you in as a technical advisor while they bring a CEO who knows business
- If you are the owner, you say I cannot handle all this stuff, so he wants to produce 500,000 cars and he's only produced 50,000 so far.
- The manager and the owner can have different ideas
- How to design a system so that the manager's interests can be aligned.

1.1 What Is Corporate Finance?
- When we look at financial decisions, 3 of them are very basic and important.

0. What long-term investments should the firm choose?

- Dropbox - I forgot my flash drive and which I had a way of reaching my files.
- Dropbox's synchronization is faster
- When you fill up the space on one of them, you have more space and network effects.
- Should I spend more money on servers or should I optimize other things?
- Apple's ecosystem and everything is synchronized with Mac, iPhone, iPad
- Unbundling!

- People think very hard about unbundling stuff by selling things piece by piece.
- When you have Google Docs and Google Sheets, it is easier to store directly into Google Drive.

0. Where do I find the money?

- GDP of Apple is a small and medium sized country
- Apple borrows money to use in investments

0. I have money or funding, and I am investing it on my business.

- I need long term investments and some short term investments to define this.
- You need cash in your daily dealings and be able to produce some stuff you have
- Paying your employees

Capital budgeting - capital has a lot of meanings depending on different things

- Generally means money
- Capital in the Twenty-First Century - book to read when free!
- We talk about things we are using in production and budgeting.
- Means money but it has a deeper meaning than that, so pay attention to capital as we are going forward.

Capital Structure

- Where do I get money to buy these capital goods? (capital budgeting)
- How much of that money do I use on my own and how much is borrowed?
- How much of resources should be kept as short-term assets? (net working capital question)

Let's assume you have $10,000 and we are going to borrow another $20k from an uncle.

- 5% interest in 3 years.
- How do we report these things and get cash by selling stuff and paying employees?
- How do we keep track of these things and determine if it is going down or up?

Originally invented in Italy by the Medici

- At this point in time, as a company/business, what do you owe/have and what is the difference between those two?
- Liabilities, assets, etc.
- What do you have in the end? (equity)
- Balance sheet has two sides
- Your assets are on the left side
- Different assets a company could have, but we already gave hints
- **Fixed assets (long-term assets)**
- Things you are using over and over again.

- Servers aren't good for just one year, but it can operate pretty soon.
- Could possibly be some things you are intending to keep.
- **Current assets: assets you can turn into cash within one year (without any loss in value)!**
- Why can't you sell a server within one year?
- You can sell anything if you put the right price to it.
- If you have a car and you want to sell it (Audi 4) for $8000, do you think I can turn it into cash within one year?
- YES!
- Fixed assets take much longer if you want to get the fixed market price, but with some market value.
- Intangible fixed assets - patents (the right to have the idea and prevent others from using it)
- Copyrights also follow this model
- Depending on the type of business, some businesses have tangible but others may have intangible assets

Right-hand side:

- Left-side is dealing with capital budgeting issues
- Right-hand side has a ton of stuff, but we need a way to finance it.
- Top portion is liabilities but the bottom is equity (shareholder's equity, owner's equity, equity)
- The remainder is assets - liabilities = equity of the company
- All these assets, and one portion is financed via debt and the other is what the company has

Capital structure

- How do you finance this stuff?

Current assets and current liabilities are immediately correlated - assets you can turn into cash within one year minus liabilities be what you have to pay within one year

- How did I finance them?
- I borrowed short-term as well as long-term
- Pay them within one year.
- I can pay them later with regards to long-term debt or with my own money.

Net working capital = current assets - current liabilities

- If you aren't investing much in the business, you don't want that difference as big as possible.
- You want an idea to bring some money back and why do we have cash sitting in an account?
- Obviously, depending on the business, some businesses really require a lot of cash.

- Others involve looking at data, and the kind of business you are in requires you to keep a set amount of working capital
- The rest will be a waste of money.
- Opportunity cost of keeping high net working capital
- You make your money sit instead!

As an outsider, how do you evaluate a business?

- Are you able to make more money by keeping a lower networking capital?
- If you can keep lower networking capital but sell more than the other guy, that is positive.
- If it is too high, it is going to be costing you money in opportunity cost
- Signal of how well you are running your business

Apple

- Has a ton of networking capital
- In their cash account, they have a lot of cash.
- Since they started, Steve Jobs was running the company and he always said that he was the owner of the business.
- Under equity, he put money in and they put their money in because they will share profits with us.
- Steve Jobs did NOT share dividends because I have things to do.
- He has things to invest on.
- Passed away (sad day)
- Tim Cook started to give out dividends.
- Investing less and not doing more new things and keeping high cash accounts
- iMac, iPad, iPod (10 years)
- Growth rate of Apple and last year, it was the first time that it slowed down since 1997
- When Microsoft was first established, the growth rate was more established.
- High growth rate for most companies at the beginning
- Important to keep a good size of networking capital

Twitter

- Twitter hoped that growing user bases would turn into a profit.
- Having as big of a user base as possible.
- Instead of having the highest profit immediately.

Friend of Mel sold his company to Google for $50 million

- Zuckerberg turned out to be a genius and who did he take?
- Facebook is taking more ad mobile than Google.

We want to make money at the end of the day, but online tech companies are trying to gain user base and take them into money.

- Twitter started with good intentions but Jack Dorsey didn't want to sell it and make it into a money making business.
- Twitter is decline and looks like Yahoo

You can think of the Instagrams, Pinterests, and dealing with that kind of a situation.

Hypothetical Organization Chart

- Board of Directors - they are going to be appointing a CEO at the top of the company
- Depending on the business, they might have a CFO, COO, etc.
- New businesses might not follow this structure for a tech company
- NOT going to be asked this chart
- There should be someone at the top, and someone who is responsible for the financial stuff (CFO), someone responsible for dealing with the outside world (Treasurer), and someone who is looking inward and preparing financials to the CEO (Controller)
- Sample statements for next year with all sorts of people working for you next year.

1.2 The Corporate Firm

- When starting a company, they start with an idea.
- Zuckerberg didn't originally know they were starting a big company, and this is accepted in the face of the law.
- The Sole Proprietorship - one person starting the business
- Partnership
- General or limited
- Corporation
- Private
- Public
- As you get bigger and bigger, this mean your product is good and used in the market.
- Found the gold laying chicken!
- How can you get to more of these things? You need money!
- You are going to be doing that at first but a good way of raising capital is having shareholders
- Open your company to the public and say I am selling such and such percentage of my company to the public.
- 1 million shares and having one millionth of 30% of my company.
- If they think you have a good product, they hope you can distribute some of your profits down the line.
- Steve Jobs will think the company is going places and the stock I purchased will gain value.
- Even though we did collect profit from a company, it will be higher now.

Why would you go public?

- It is easier to create a lot of hype and let's get the share of this company (IPO) - initial public offering

Does U.S. need equal amount of gold to support everything circulating around the world?

- It has value because we say so!
- Stocks don't promise anything.
- If the guy decides to give you dividends down the line, that is a good thing!
- If not, sayonara!
- Selling shares to the public is good because you are selling this stuff and not promising anything.
- When you IPO, there is no guarantee people will buy your shares!
- I think people are going to pay $38 for my shares and then it started to go down.
- When someone doesn't pay something, what happens?
- Price starts to depreciate.
- SpaceX is badass!
- In any case, if your investors are passing 500 and you are passing $10 million you are officially public.

Pros and cons of going public

Pros

- People who are not aware of your product will learn about it and this people is reading it on the first page of Wall Street
- Market valuation - down the line, if you need to borrow money, you need to pay it back and you want to pay it back as little as possible.
- Having good visibility and going pubic under your belt
- If you are selling 30% of your shares and if you raise $500 million, that will translate to an over $1.5 billion company
- Uber's valuation is $62.5 billion as of 1-11-17!

Cons

- You have to start to listen to other people and the shareholders.
- All these shareholders are talking
- You can try opening to another market.
- Which idea are you going to pursue?
- Carl Icahn is a guy who tries to get significant portion (1.5% of Apple's shares)
- You have to hire either Goldman Sachs, Merill-Lynch, etc. - costly!
- Beyond selling your stocks, they provide insurance for you and I am going to sell your shares at $38
- I should give it to Merill-Lynch and it's a shame if the stock doesn't sell at $38

- Fee for Goldman Sachs will be hire and the service is to sell your stocks.
- Management loses some of its freedom to act without board approval
- Acquisitions - good product managed really badly
- Yahoo was offered $45 billion back in the day by Microsoft - big mistake to say no!
- If the buyer is really determined, they can go and start to buy your shares.
- Keep managers in check and if the company is taken over, the first thing that is done is firing the management.
- One of the in-build mechanisms that keep the managers in check.
- In the article, there is a difference between the owner of the company and the person managing the company.
- One of the in-built mechanisms is the business of needing to act.

Going Private?

- Public company and you can revert to private
- Dell!
- Dell was very popular - I had problems with Dell
- Mac for 8 years and it started to buzz because it made noise and it healed itself.
- Magic of Apple - emotional attachment to Macs
- Michael Dell was a student at University of Texas and he saw a need for customized computers
- He will be selling laptops to customer's according to their preferences.
- Assemble it and send it to them.
- Company was very successful and went public.
- Michael Dell was founder and CEO and was very good.
- Dell could NOT come up with a good tablet for the market
- Focus only on business offerings (enterprise-level)
- Company could then go public or private.

A Comparison

- Corporation
- If you are a corporation, what happens is that you will make money, have revenue at the end of the year, and you will pay corporate taxes.
- If private, you can pocket money as income! (Taxed again as income)
- Corporate revenue is taxed **TWICE**!
- Separate entity from you so liability is limited.
- Establish it as a corporation and the company has a lot of debt and is bankrupted.
- You have the money, but you (the owner) are separate from the company
- Partnership
- If the company has debt, they will go after you.
- Revenue is NOT going to be taxed twice.

W 1 Dis 1-13-17

aysanranghchian@ucla.edu

O.H. Thursdays 11-1 and 3-5?
6532A Boelter Hall

2 midterms and learn the material

Finance says you have a resource and how do you handle it?

Business types:

- Sole Proprietorship: I am my firm and the firm is not a separate entity
- Partnership: Limited partners, general partners - the one person takes responsibility and the others do not have responsibilities
- Corporations: Can be public or private

Sole proprietorship

- Easy to manage and I don't have to convince anyone.
- I make a decision and I make it happen.
- I have an idea so let's go get the patent started.
- Good to have one tax as we all love it and we can do tax deductible things and put mortgages and get rid of some parts of taxes.
- Full control is not good because the business is me.
- Limited lifetime and if I die, it is hard to transfer ownership
- Part of liabilities as one single person
- What if you leave it in someone's name?
- Partially the law of having a sole proprietorship and it is tough to transfer it to another person.
- It is just you, yourself, and a firm that is registered somewhere.

Corporation

- How can we handle this?
- 100 people want to be heard and their decision to be made.
- Different people with different opinions.
- Limited liability
- Double taxation
- You have to be registered in one state, and in some states, you can get rid of one of those taxes.
- LLC corporation if you want to get rid of one of the taxes
- If someone dies, the business is NOT going to die.

Exercise 1
A building owned by a single individual is called a:

- Sole Proprietorship

Coming back from a Corporation to a Sole Proprietorship is very difficult compared to going from Sole Proprietorship to Corporation

Exercise 2

A general partner:

- More responsibility than a limited partner

Public and Private:

- It is your decision to go public and go back to being private, but these transitions are hard to do.
- You are going to have to show what you have done every quarter as a public company
- Huge private companies have a brave investor sitting there injecting cash.

IPO:

- I want to go public and how much will I be worth?
- 100,000 shares and I need 3 billion
- You come up with a price of the shares and let's sell this many shares.
- Not 100% predictable!
- When you have the public face of your company, people will trade everyday.
- Indirect effect of selling something at a value higher than yesterday, so the financial district will count that firm more.

Exercise 3

- It will reflect the overall price of the company
- If someone is selling my stock at a low price, people will buy that.
- They have to again decrease the price because in the financial district, they won't trust us anymore and if we want to buy stock, no one will trust us anymore.
- The stock price indirectly affects the position of the corporation.

Principal agent

- Principal - someone who owns the company
- Agent - manages the company in a successful way
- If I am the manager of a big company, I see my life in 5 years
- It depends how they are doing financially?
- Even if they are shareholders, you can fine them.
- The agenda is short-term sometime for managers and they can play with some numbers.
- There are ways to legally postpone the liabilities of the firm
- Balance sheet is going to look really good!
- In 2 years, I will leave to a better company.
- I am a manager and I want success right now.
- I think of it as a 2 year project, and as a shareholder, if it goes down, that is your money.
  - Principal-Agent issue
  - You might make some cost that is not very vital to do because it makes you look good.

Shareholders and management

- Shareholders are principals who care for the company over long-term
- Managers just want to look good!
- Bonus at the end of the year.
- If position in the firm is unsecure, we want a backup plan
- **Try to their agenda with your agenda!**

Let's have a bunch of people to show us what you did the last 6 months.

- Manager can step towards expansion OR avoid risk in the time being.
- American Apparel got bankrupt
- Continued to produce in LA which was very expensive

Exercise 4:
Agency costs refer to:

- The costs of any conflicts of interest between stockholders and management

Exercise 5:

- Agreeing to expand the company at the expense of the stockholder's value

Exercise 6:

- All of the above
- If there is another firm out there that is buying out companies, I am thinking my position is unstable!
- What if they buy my company and fire me?
- I am responsible for this strategy and we have a couple of managers that are responsible for each strategy
- Let's avoid them buying us, which is going to entail firing me.
- A is true because I have a director above me and they do care about long-term and short-term success
- I may or may not have some shares and this isn't necessary conditions for me and the management.
- If I don't have it, the chance of me caring about products in the short-term is higher.
- You can vote if you have a lot of shareholders.
- A lot of people are going to be elected.
- This is something that is going to make me strive to do better.
- Let's show them I am doing good and someone is out there.
- I know I can do good and show this fact to the shareholders.
- They are going to trust you depending on your history.
- C emphasizes encouragement for the managers to support the shareholders

W 2 W Lec 1-18-17

- When you own an asset, you want to use every little bit of information and figure out how things are managed.

- We started a company and we wanted to keep this much in our current assets
- Where do we get these funds?
- Two major sources of funds for a business.

0. Debt: borrowing money

- Long-term debt is **bonds**, when a company wants to get plain old debt and pay interest.
- Borrow money and pay 8% interest per year, and the $1000 will be paid at the end of 5 years.
- Issue a bond with a face value of $1,000 that promises to pay 8% per year.
- Governments and other institutions use bonds as a way of collecting money.
- The good thing about bonds is you collect the money and you can see the future and plan ahead.
- The amount of money I have to pay from the investors' point of view because you know how much money you are going to be getting each year.
- This kind of trading is called **fixed income market**

Q. Can companies default on bonds?
A. They don't pay and it happens! We don't have enough money! So borrow money but I'm kind of screwed. Sell all the machines you have since you are bankrupt and bring us back our money. You are legally required to pay back.

- If the stuff I have is terrible, and the debt I have is a lot, that is bad. When you lend money to Apple, they don't pay back with interest!
- If you want to stay as a private company, you are restricted in that area.
- For a public company, I would like to invest $350 million into my factory, and I have to fund this.
- When you issue stocks, you have to go through a ticket master i.e. Goldman Sachs, Merrill Lynch, etc.
- You avoid this by issuing bonds.
- Stock market has distributors where you can communicate them, but bonds are catching up and big institutions are going to buy bonds.
- You can just go about and pick this route of getting money from big institutions since they have a lot of money.
- Also, some pensions have rules saying that 50% of our money is spent on bonds.
- Continuously looking for bonds because it is fixed income.
- There is certainty about bonds and we would like to invest our money on bonds.
- Already customers for bonds.
- Dilution: the value of each stock per person is going down if you issue more stocks
- Make existing stockholders mad and that is another problem.
- How can you sell your stock?
- There are a lot of companies selling stocks, so how do you make yours attractive?

- Financially managing your company well, growing it in terms of customer base, revenue, influence.
- Even though there is NOT an explicit cost, you have to invest enough money to make your company grow s.t. your company reflects this growth.
- Implicitly, you have to pay back, so there is a cost of issuing out stocks.

Q. Why would a company care if they issue out stocks?
A. It is dispersed and nobody has a majority of it. It gets diluted!

- If a company is NOT doing well, it is going to get reflected in the stock market.
- Apple is doing really well, and they are competing with energy companies to be the biggest.
- Collects widely dispersed information into one beautiful number.
- This is reflected in that price.
- The price gives you information about what the market thinks about this product.
- Some products like Picasso paintings have **shallow markets** - few buyers and sellers
- Other things like the stock market are **deep markets** - a lot of information is collected and is important in giving information about a company's well-being and signals whatever this company does, the people who are thinking of lending will check what the status of the company is
- Check growth level and see if it is doing even better in certain respects.
- If I want to sell my house, do you know what you are doing?
- I am going to give you $10,000 and there needs to be incentive to sell.
- The management can maximize the size of the company and get other perks.
- New incentive mechanism from the academic -> private world (stock options)
- Why don't we make these guys owners so that their interests and the owners' interests align?
- If their stock goes up, my pay also goes up.
- Enron scandal
- Shows the negative sign of that mechanism. If we do not design the mechanism well, you are not going to achieve that goal.
- The managers' interests are not aligned and this is going to be reflected within the stock price.
- Enron lied to shareholders using faulty profits, so they could sell out their shares and make money, but there were actually no money in the company.
- One friend of Mel who went to HBS joined Enron after graduation and said they were doing well.
- The next day, the genie is out of the box; no new inventions and financial energy going in.
- All of it was a big hoax. Goes from $90 to $0, and the people went to jail
- Financial securities collects money from the market and this goes into the firm!

- This constitutes our capital structure and this could go into our capital budgeting.
- Hopefully cash going into the firm is less than the cash coming out

Q. What kind of company would share profits?
A. Take the money and invest it into R&D, but if you are more mature, you can send the money back to investors and never distribute it back to investors and do things.

- Apple's growth rate with the iPhone was exceptional
- Money that is invested back into the company is called **retained earnings**
- The tax rate is about 35%, but the actual amount you get taxed is 20% because of tax loopholes
- Donate to non-profits and write it off.
- Take your money outside!
- Apple has a lot of cash outside of the U.S. because bringing money back to the U.S. is more costly than borrowing money in the U.S.
- If money you are making comes from intellectual property, some companies do NOT tax that!
- CBS episode of big companies in Ireland to take advantage of tax breaks!
- Valuation of stock depends on a chain of events and it depends on an entire projection for a stock.

0. Equity

1.4 The Goal of Financial Management

- What kind of goal should I set for my firm?
- The best use of money that I have.
- Which number will show you if I am doing a good job?
- Opportunity cost of certain things.
- Is the company maximizing its profit whenever it can?
- Is the company thinking about its owners?
- All of these questions are important things for financial management to ask
- Trying to survive and get a foothold in the market
- Get in debt and bring all the money so you can invest in things and grow
- Your goals may be different from your short-term goals and medium-term goals
- For a company in a mature state, the ultimate goal is to maximize the stock price.

Stock price reveals information about this company

- If something is wrong with stock management, profits, etc. this will be shown in the stock price.
- **Maximize shareholder wealth is the ultimate goal!**

2.1 The Balance Sheet

- One of three financial statements that we are going to discuss is a snapshot of the company at one point in time.

- Company frozen at one point in time shows what the company has, how much money the company owes, and what the difference is
- **Balance Sheet Identity: Assets (equivalent) Liabilities + Stockholder's Equity**

U.S. Composite Corporation Balance Sheet
- Let's try to understand the major accounts that a balance sheet would have.
- Any balance sheet you are looking at would probably have these accounts
- Asset side on the left and liabilities + equity side on the right
- Owners and shareholders and stockholders == equity
- If the cash account is too much up, what is the downside of it?
- Lost opportunities because cash accounts sitting there will NOT make you money!
- You don't want to sit on a pile of cash without it doing anything.
- Accounts receivables
- Sold the product and you didn't collect the cash yet.
- Inventory
- Sold within one year.
- Current assets: stuff we can turn into cash within 1 year
- If not sold within one year, is that a bad thing?
- Take an average of two months to sell, so what does this mean?
- Selling slower! This means there is a problem.
- Everything is recorded **at cost** - selling 30 items at **a hopeful** $30 per piece, so should I record it at $900? No, if I actually sell it at $5 per piece, then $150

Q. What is bad about recording **at cost** vs. **at market value**?
A. Especially if a company has obscure assets like Picasso paintings, we can report stuff at cost that is NOT up to date. We would like to have an objective statement rather than up to date and subjective.

What is the best way to depreciate this stuff?
- Depreciation is shown as a cost item, which allows you to pay less taxes.
- Determining how much stuff is depreciated according to your goals.

Per year, a machine will equal depreciate, and at the end of 2000, its value will go down to $800
- Assets are listed in order by the length of time it would normally take a firm with ongoing operations
- The more liquid is at top, the less liquid is at the bottom.

Liabilities:
- At some point, when you are declaring your balance sheet, the supplier has NOT paid yet for the supplies, so this goes under **accounts payable**

- **Notes payable** - short-term debt (something written, you have to pay it!)
- **Accrued expenses** - expenses that have built up but not paid for yet. Energy bill for a factory

Stockholder's equity

- **Common stock**: Company issues this. Founders want to keep control and do NOT give voting rights for the people
- **Preferred stock:** hybrid between bond and stock and caters to a type of investor. Distributes dividends for sure and gives money at certain times.
- NOT traded as much as **common stock**
- NOT as much upside as common stock, but you get steady, fixed amount of income
- Whenever we say stock/share of a company, this refers to **common stock**
- When companies issued stocks, you would write money and put a par value.
- When you IPO, this can be found under common stock and capital surplus.
- This happens when you IPO
- **Accumulated retained earnings**: How the company mostly grows
- We made some money and we are going to make this company grow - put this money back in the company and this is an account that shows that the money we made before is coming back to the company.
- Put that money back in the company.
- This is the major way of growing the balance sheet of the company rather than getting debt.

Warren Buffet - the most famous investor in the world

- "Why would I buy back my own stock?" - then he does it LOL
- We can see the asset side and the liabilities and equity side.
- The company records everything it has and the value of the balance sheet shows the value of the company.
- The staff, image, potential developments, etc.
- These things are NOT shown in the balance sheet.
- Long-term debt is the bond and we pay the interest at the end of the year.
- This interest is deducted from your income statement.

W 3 M Lec 1-23-17

- Demand is going high and you have a lot of competitors, so your expectations are based on some margin.
- Relative to the expectations
- Game theoretical problem of meeting expectations
- Markets are trying to expect the correct results - game of matching

- If you know that you are going to be making a lot of profit this quarter, your profit was going up 5% every quarter, and every three months, your profits are increasing.
- If you reshuffle things in the business, you do NOT see that going into the future!
- You cannot sustain this, so what should you do as a company?
- You should have that profit increase or think of something else?

- Out there, investors are getting advice from the market specialists who are estimating your profit and setting up expectations for your company's numbers.
    - Your company is increasing its profit and you know there is going to be a spike. What would you do?

- I am a company (IPO'ed) and I am trying to announce my financials.
    - How much profit and money I made is available and how much money I spent to make that revenue.
    - Announce all of these things and my profit started at this level and how was it compared to my competitors.
    - It is public knowledge and I know that within the company, due to whatever reason, my profit is going up by 20% and I cannot sustain it going forward.
    - In the long-term, thinking from this perspective of market expectations, what should I do?

Q. How many resources can you devote to capture these guys?
A. Is this is a good thing to do to announce 5% if you are making a high profit?

- If I announce 20%, I am making expectations, so put trust in the guidance of the company.
- Keep announcing it in a few days to make it 5%.

Q. If you perform the analysis, could you make some decisions to lower down your profits? Why not invest in capital budgeting decisions to bring that expectation down.
A. Draw your attention for reading between the lines. Companies can play this game with the market and meet expectations. What do they expect about the companies numbers and what do I expect?

- Strategic game is being played in announcing these numbers to the public.

Q. How does depreciation affect the numbers here?
A. Companies have a lot of items here to play with numbers.

- General Electric had a special department for buying other companies for good cash flow in case they cannot meet expectations for that year.

Financial statements are not there to track the numbers only in an objective way, but also a way to communicate the long-term goals and current situation that the company is in for the market.
Q. What is bad of having a lot of current assets?

A. Not investing those assets and it depends on what we may have. What are the big assets that the company has that does not show up in the balance sheet?

- Balance sheet is not providing a perfect picture of what the company owns.

Employees, image branding, opportunities

Goodwill

- When Google purchased Youtube many years ago for $1 billion, everyone was surprised!
- Youtube doesn't have any profit and they were surprised!
- If you looked at Youtube's balance sheets, it would NOT amount to $1 billion
- Company's balanced sheets have an account called goodwill, which doesn't have anything to do with its name.
- Purchase a company and write all the assets under your assets.
- I purchased Youtube and what does it amount to?
- < $1 million
- Paid for all the intangible things and pay for an account called Goodwill.
- This represents all the intangible things that the company has.

Q. The balance sheet is very strictly regulated and you cannot do future value of things. How do you put a value on goodwill?
A. Whatever you purchase is your decisions, so you place values on the intangibles. It isn't a subjective number because you paid that amount and all the assets + liabilities are written down.

- Officials agree that you have to declare values when you purchase a company so there is no collusion.
- Whenever an intangible is a subject of transaction, it is no longer subjective so there is a market value attached to it that is recordable.

Current Liabilities

- These are the typical ones you see and we are trying to understand the financial statements of companies in general terms
- Any kind of knowledge you can get is very impressive
- Notes payable - written down numbers

Long Term Liabilities

- Bonds
- Deferred taxes if the deal with IRS is to pay some part of your taxes and that payment would take more than one year.
- The left side shows what you have and you can acquire those things and where the money comes from.
- By definition, lhs = rhs

Q. Does the balance sheet represent new things in the year?

A. Accumulative statement so it starts when you start the business. You write down your balance sheet and figure out what the difference between them is. Whatever changes on your balance sheets is recorded on top and replaced.

- Analogous to ATP rankings system

Your stock used to be represented by a document, and more often than not, the market price you got would be different.

- Capital surplus is how much you get from selling your stock.
- I collected $27 (answer) per share and 27 * 2 = $540 million
- At the end of 2017, I record common stock and capital surplus together.
- In 2018, the stock went up to $38 (hypothetically)
- What do I record in the balance sheet?
- After selling the shares, they are free to be sold in the secondary market.
- Traded into company's

If Apple is selling a computer to me by me buying their product, and if I sell it to my cousin, they don't get anything.

- If the secondary market is really low, would this affect the company?
- YES! It affects it indirectly even if the stock price does not go into the company's books
- Indirectly, the company is affected using the same logic and the sales that are taking place is telling you something about the company.
- Price tells you something about the market if the manager is planning on issuing new stocks or if the company is borrowing money.
- When you lend money to somebody, you want to know if it is good or not.
- Stock price is one factor that determines how good something is.
- If all the people understand that and just sell stocks, how would it affect the company? It isn't the company's fault.
- Any analyst who looks into stock price will take this into account.
- How is the stock price moving for this particular company and look how the market is moving.
- **Everything is weighted relatively.**
- Think of the wider market and what is happening there.
- Markets are always inefficient (debatable) but if you read the executive summaries, they know the performance relative to the market.

Accumulated retained earnings

- I started a company, sold 150 shares at $30 bucks per unit, and I want to separate the entities and not be liability for anything that may go bad.
- Put it under retained earnings and look at how much of the profit I make should go back into the company.
- I decide and I put it under accumulated retained earnings
- Makes the balance sheet get bigger
- Does this stay there?
- NO! It is the source of the money and you can put it on the cash accounts.

- Increase the accumulated retained earnings results in increase in cash/ equivalents (direct correlation)

Two ways to increase the size of company/balance sheet

- Produce, sell, and put it back into the company.
- Borrow money (increase in RHS) and do something with it
- Some companies prefer to borrow money, while other companies prefer to grow organically.
- Other companies do a combination (depends on the situation)
- Treasury stock is indicating the amount of purchased back stocks over time and it is cumulative.
- To that date, the company has that much treasury stock and in 2009, they had 20 million dollars worth of stock in their treasury.
- They can distribute it to their employees and do various things to those stocks.
- Between 2009 and 2010, they purchased more stocks because this amount when down to 26

- **Purchasing treasury stock causes you to lose cash !**
- Why would you do this?
- Good investor (Warren Buffet) who says never buy back your own stock.
- Hypocritically buys his own stock

Per company, how much do investors pay for this share?

- Price earnings ratio is something company's look at.
- How can I increase my earnings per share?
- Earnings divided by shares - if I can make this smaller, this ratio will be big.
- They buy back their shares so price earnings ratio will be automatically looking higher.
- In that year, your earnings per share is high that quarter.

Q. If your stock is at a higher price when you have to buy it back, wouldn't this be a waste?
A. With that cash, you can do whatever you want to do.

- **Buy back shares in order to gain more control of your company!**
- Warren Buffet wanted to buy back his shares and sell it back at a higher price later on.
- Cannot find any other way of spending money in a good profitable way.
- If you buy back your shares, you don't have to mention financial statements.

The company image is very important, and what the market thinks about the company is very important.

- Quarterly reports, tweets, images of CEO -> convey some sort of future expectation of your company of the potential earnings your company has.
- If you think all of these does not resonate with the market, send a signal to the market by buying back your own shares to show belief in your company.
- As a financial manager, buy back shares because I know these companies are going to places in the future and I want to send a signal to the market.
- With tech companies, it is hard by the market to put a correct value on the market.
- Tech companies buy back shares a lot in order to say you are not correctly pricing my stock.

Income Statement

- Accounting definition of income
- Revenue - Expenses === Income (definition)
- Net income, profit, earnings all mean the same thing
- Operating section comes on top, so we need to know your core operations!

- Operating revenues - money you get from selling the product you are selling in the market

Three major cost items

0. Cost of goods sold (COGS) - to produce that operating revenue

- Ingredients, supplies going into production
- You want companies audited so you can put up real numbers.
- You can pay a company to audit you and you could actually pay the other company.
- **If these guys talk shit, hire someone else**

Q. Would tax returns be more conclusive than income statements?

- Take these statements with a grain of salt

Auditing over one year with the money you are making by selling your product.

- Go over your account to see if the receipts you have are reflected in your books or not.

IRS will look into your taxes

$20,000 is not the cost of producing 150 units that I produced.

- Depreciation is the portion that corresponds to the production of that year.
- To record this depreciation, you can use a cost item that directly affects how much money you are making and how many taxes you should pay off of this.
- Companies prepare a statement for the IRS and what will they try and do?
- Show that depreciation is a legally possible maximum amount.

- Let's look at good company's with high operating income, and they have a good product.
- Problem: Interest expense and pretax income is high!
- **These company's are targets of acquisition!**
- **In-built mechanism that is going to motivate the management to do a good job.**

Earnings before interest and taxes (EBIT)

- This is important in demonstrating whether this company is sound because we see results before taxes

Taxes

- Deferred items are NOT out of pocket costs but you will pay it in the future.

Net income: Not total case in pocket at end of the year because of things like depreciation, deferred taxes, etc.

Net income = Pretax income - Taxes

- High growth companies will never distribute dividends and they are mature.
- They will have a policy where every year, 2/3 of our net income go to our shareholders

Media affects our view of things

- Government provides a lot of subsidies, and they were expecting these subsidies to continue.
- Whatever these companies like Solar City, Tesla, SpaceX planned would not happen
- However, Trump meeting with Musk brought up increased trust
- Elon's shareholder meeting addresses talk about if it was beneficial without subsidies in the Internet.

W 3 W Lec   1-25-17
Quiz
1) By having your business formed as a corporation, the owner

- **✗ has unlimited liability**
- **✓ income will be taxed twice**
- **✗ has to make all its financial statements public**

Midterm next Wednesday (February 1)!

- Office hours Monday and Wednesday (3-3:50 PM) each week
- Another office hours next week
- Next Tuesday between 2-3 PM

- Including the ones she has regularly.
- Wednesday: 3-3:50 PM
- Calculator for the exam - simple calculator!
- Don't clean the memory and shit
- You can bring a regular 8.5 x 11 paper on one face.
- Write whatever you want if it is an equation, definition, or graph
- No solved, numeric examples
- Format - we cannot ask open-ended questions, but we have multiple choice questions, T/F questions, and numeric questions.
- Expect a balance sheet question for sure!
- Income statements!

Apple started to create their own original content

- Saturated market and this may NOT be such a wise idea
- Diverting monetary resources and NOT coming up with a big product
- Their sales went down for the first time since 2001.
- Now a mature company trajectory.
- They are in the process of coming up with a new car!

Tesla - subsidies are close to $1 billion for all three of its companies

- Energy companies are getting a lot of subsidy
- Subsidy - Money from the government that is a set of rules

GAAP - according to generally accepted principles, expenses should match the revenues

- If I sold something i.e. 150 units of laptops, then the cost of producing 150 units should go into it.
- If into that time, I purchased more inputs and didn't make the commodity to sell it, then it should NOT be recorded.

Debt vs Equity

- From the firm's perspective, when you issue debt and bonds, you have to pay the interest and pay the debt back with stocks.
- There is an indirect cost of competing against all these other people trying to sell stocks and you should be offering something to the investor to make your stock attractive.
- Invest in your company and match the expectations of the market.
- This is an associated cost of getting money by issuing stock.
- Even if you don't have to pay dividends, there is an indirect cost to make it attractive and competitive in the face of people who have a lot of choices to invest on.
- How are you going to make your stock competitive?
- Meet the growth level projections there.
- The size of the company is $5 million and we borrowed by issuing debts and the other $5 million from stock.
- Purchase $10 million of assets

- We are going to be liquidating the assets and paying it to whom?
- Paying it to the debt holders first and then after that, if there is any money left, we pay the stockholders.
- Assets are going to be liquidated and what are you going to do?
- You are going to go after the owners at Laguna Beach (rich bastards)
- The debt holders should be paid.

Produce 200 units and sell 150 at $30 per unit.

- It costs us $5 to produce this and we now have 50 units that we are going to be recording under inventory.
- Everything is recorded at cost, NOT market value.
- This is also correct for any other asset item you have.

Value versus Cost

- Stocks - record it at the initial amount we sold them.
- NOT at the market value right now.
- They could be sold at $19 and that is their equity on paper

Non-Cash Items

- Depreciation is the biggest concern

2.3 Taxes

- Corporate taxes were quite high in the U.S. but when you look at the effective taxes, it was about 17% which was not that low compared to the rest of the world.
- Legal shenanigans and this is very well known.
- Close loopholes which the current administration is claiming they are doing relies on the help of other countries.
- Hard to make everyone agree on the rules of the game

US Corporate Tax Rates

- Targets three different companies
- Small business
- Medium size business
- Large business
- Below 50,000 -> Tax rate is 15%

Marginal tax - if you make $300,000, how would you calculate your tax?

- If you make $300,000 + $1, that additional $1 is taxed at 39%
- When companies calculate costs of projects, it depends where they are at.
- With this project, it will be taxed at 39%
- If on the other hand, we have a company trying to take on the same exact project, the marginal tax for that company will be 25%.
- It will be a weighted average of all these percentages and the weighted average is your average tax.

Q. Why don't entrepreneurs make a bunch of corporations under $50,000?
A. Making corporations is expensive, image is important, and lawyers charge a lot of money ($600/hr)

Q. Why do you need to hire a lawyer?
A. You need to hire a lawyer because of the following. A bunch of engineers get together and start a company. These business people have the mindset where you read documents and don't understand anything.

- Create business forms that marry two advantageous aspects (LLC)
- You can find these things but the SEC says that if you are acting like a corporation, I won't allow that.
- If you stay under the radar then you can stay there.
- Don't be liable and don't pay double taxes
- Who doesn't want to have a lot of investors?

Let's ask Snap people, they want a lot of investors!

Q. Is marginal tax rate the same as personal income tax?
A. No, this is completely different and is just applied to corporations. Same idea because we have tax brackets.
- It is a step function in that regard.
- Not a differentiable question but it is continuous.
- They made sure it was continuous because jumping from one to the next means you won't be gaining anything.
- The tax curve or function is continuous and no gaps.
- Kinks though and you cannot jump from one bracket to the next.

- Corporations are paying double tax
- Why establish a company as a corporation anyway?
- Limited liability
- Could they have a different way of establishing liability?
- When SEC oversees these activities, if they detect the company is a big corporation, they won't allow that status.

Q. Where is the double tax?
A. You as the owner get the result of the tax. When you take money out of the company, then that money is taxed at personal tax income rates.

Numbers are NOT updated all that much and we have 2% inflation on average per year.
- If you are making $1 today vs $10 today, those are very different things
- These are screwing stuff so be careful

U.S. Effective Corporate Tax Rate

- Actual amount that they pay and the actual amount they make in the U.S. is 50% in 1947, and it keeps dropping until around 1984 when Carter was president.
- Reaganomics - supply side economies and cutting taxes

2.4 Net Working Capital

- The financing costs (interest) we pay on the loan that we borrowed
- Shows us the taxes but the net income is NOT the total cash we have at the end of the year.
- Depreciation even though we aren’t paying anyone out of pocket costs.
- Concentrate on getting the cash flow
- How much money are we making and where does this money go?

If a company is growing, I will need a bit bigger buffer

- As company grows, the net working capital should grow with the firm
- You need to find cash to make current assets > current liabilities
- If a company is growing, we will see the NWC go up as well.

U.S.C.C. Balance Sheet

- Current assets - current liabilities in 2010
- The net working capital increased from 1 year to the next and the net working capital went up by $275 million
- It can come from different places.
- Borrow money
- Selling stocks
- See if company’s money is coming from assets side or from the bonds side (the company is at the end by borrowing)
- Equity side?
- How much of the cash is going to our creditors and how much is going to our stockholders as dividends.

Q. Because there are current assets and current liabilities, there is no relationship between these two numbers?
A. My sales are growing at 5% and my net working capital has to grow too since I have more stuff to produce. It ends up increasing by 2% from one year to the next.
Q. Good or bad?
A. It is a good thing because the company is using resources in an efficient way. The company should pay dividends with a shareholder, and it didn’t account for increasing inventory or cash.

- At the end of the day, the company decides if it wants to pay dividends, so we have too many degrees of freedom to play with.
- If they are making more money but keeping net working capital low, they aren’t just hoarding stuff.
- Companies are growing and the sales are growing.
- Net working capital has companies thriving and doing a good job.
- It is a good thing because they are still managing their current assets well!

- To be able to find net working capital, you need current assets and current liabilities

Q. Is there an industry where you want a high NWC?
A. Inventory is a part of the retail industry, and they want **high** current assets i.e. Target, Walmart, etc.
Whereas, Google or FB have low current assets if any!

2.5 Financial Cash Flow
- Cash Flow is defined by this equation, which says that the remaining money will be used to pay debt or perhaps stockholders.
- Where does the money come from? That's why I call it cash flow to and from assets.

This is our big equation for the cash flow and the asset side has three parts
- Operating cash flows - money you are making from our core business

Net fixed assets - Most probably not. The amount of depreciation is determined by how much you should decide.

Operating Cash Flow - (add EBIT + Depreciation) = Cash Flow

- Over the years, the net working capital is going up or down, but in relation to what you have.

My purchase for a machine for fixed assets
- Your over year, if I keep money in the company, it goes to retained earnings
- Is it like a bucket that shows the cash? It should NOT!
- Purchase more inventory and fixed assets.
- For dividends, if it is NOT given in an income statement, can you figure out the dividends in 2015

Q. If not given Dividends and Retained Earnings, can you figure out what stock amount when given a future date?

Q. Why is the retained earnings different in 2013 than it is in 2012?
A. At the end of the day, if you are not making money and do not have a good prospect, you have to have something i.e. customer base, business model, solid operating cash flow, etc.
- Finance some borrowing and selling stocks.

Apple can borrow money at a lower cost than the U.S. government can
- They are definitely going to pay back my money!
- U.S. government is in a deficit!

Q. Where does the cash come from?
A. Look at cash flow from one year to the next and they have two finance people. Controller and treasurer.

Financial Ratios and Planning

- Price earnings ratios - we are going to be covering 5 different categories of financial ratios

Categories of Financial Ratios

- Profit margin is important and what percentage is capped within the company
- We will talk about the following: some industries are notoriously bad in having very low profit-margins
- Retail industries for example
- Other companies have high profit margin
- Drugs
- Apple Inc.

Q. Why do people invest money on Target or Walmart's stock?

W 3 Dis 1-27-17
Business cash flow

- Negative cash flow is nothing to be scared of
- Negative sign means cash flow is going out
- It may be different and if the interests - long-term debt = (neg) then I am receiving money as a company

Cash flow from assets

- You have a 2nd and 3rd one showing up negative
- Paid to buy capital so that's why you deduct it from Operating Cash Flow
- When you are trying to find cash flow for the firm, you spend it negative on buying new assets and net working capital

Operating Cash Flow

- We know depreciation is not cash flowing out so let's add it back to our calculation
- We see depreciation in income statement
- By tax, we can calculate it using ratio or sometimes if dividends are NOT on your income statement, it doesn't mean you didn't pay dividends
- There is some difference and some of it may have gone into dividends
- If you don't pay dividends where will you see it?

Capital spending cash flow

- See the change in your current fixed assets and this change is a cash flow

- Capital spending is at the end of this period and how much net fixed assets do I owe?
- Depreciation is related to the year you are trying to find cash flow

Cash flow to NWC
- You need 4 different things to add up
- Ending balance is your (NWC) = current assets - current liabilities
- Current assets of 2007 and that would be your beginning
- You need to find additional net working capital or not

Cash flow to creditors
- Normal people who will give you money over the course of some time period
- If my ending long-term debt is bigger than my beginning long-term debt, I am receiving money!

Cash flow to stock holders
- If you sell more stocks than you buy, then you will receive money
- Elements of stock
- Common Stock
- Capital Surplus
- Treasury Stock

Exercise 1
- Net income: Have I paid tax?
- Net income means you have paid tax:

A. **383**

Exercise 2
A. 812

Exercise 3
A. **-93**
- Find different reasons behind change in net working capital
- What is the difference from one year to another

Q. For current assets, we have to add up cash + accounts receivables, and inventory. What are some other things that add up current assets?
A. There are many factors to include.
- Accounts payable, electricity bill, utilities, cash payable, etc. would be included as other liabilities

Exercise 4
A. -57

Exercise 5

A. 297

Exercise 6
A. 447

Exercise 7
A. 70

Exercise 8
A. -35

Profitability ratios
- I made a huge sale and if it is too much net income, it won't be a good reason
- How much net income do I have using my asset?
- Sitting on this much asset and make this much of net income.
- Return equity and income there.

Market value ratios
- Try to compare yourself in the market.
- This is a market with X amount of shares
- How much of m shares are sitting next to my net income.
- Per dollar, how much would it be worth?

DuPont identity
- Net income over equity
- It doesn't mean you are doing one thing bad!
- You have to figure out what you are missing in your opportunity.

Exercise 10
- How long does it take for her to sell inventory and receive the accounts receivable?
- How many days does it take for industry turnover and how long does it take to get rid of that inventory?

W 4 M Lec 1-30-17
- Room for review session and we are going to announce it now.

At the end of the day, we want to know how much cash the company is making and how much is flowing out.
- From the two examples we have, we know that cash flow (to/from)
- Assets - you produce stuff and the money could come from the creditors' side
- Either you are going to borrow some money or you will have to sell some fixed assets or something
- Can be negative or positive at the end of the day

- Every year, the money can be one source or the other

Some companies, especially startups, are aimed at selling their business to a bigger operator and have them figure out how to make money.

- Down the line, you want to make money somehow from that business

Twitter

- Valuable to other big ones and ultimately, we are looking to make cash to establish a good revenue model
- Financial statements, keep all of this in mind and analyze things like that.
- Analyze real companies of your choice
- Please read between the lines and don't just look at numbers.
- These are the kinds of things anybody can figure out but figure out what something means

Let's say I purchase a business and collect money

- $500 I borrowed money
- Got a fixed asset of $200
- Made money by selling things I produced at $1000

Q. At the end of the year, how much cash flowed into this company
A. Very simplified version of the account with lots of different accounts

- Creditors are the debt holders and issue debt
- Bonds
- We want to borrow money, are you going to buy our debt?
- $500 flew in from the creditors' side and $500 flew in from the stockholders' side
- Money is coming in and going to some other places
- Where does the money come from and where does the money go to?
- You ended up with money not coming in from assets side and money is NOT coming in from that side.
- Cash flow from assets side should be equal to cash flow from creditors and stockholders
- Cash flow from assets = cash flow from creditors + cash flow from stockholders
- This is NOT the normal circumstance for a business!
- At times this may not happen!
- Use cash from/to methodology

Q. Let's say you make a loss on production (too much stuff and not selling). Let's say you don't issue stock or borrow money. How is the money from your pocket represented in the cash flow?
A. Cash is under current assets, which is part of net working capital. Net working capital is to/from assets. Fixed assets and the other portion is from investments. Depleting the networking capital and within the assets, you are rearranging stuff.

- Finance my loss now and I won't bother with the debtors or stockholders

- Create hype about the company
- Loss means I have revenue but the costs are higher
- Cannot go like that forever
- If people are lending you money i.e. U.S. Government is perpetually in debt, what happens?

Know how to standardize financial statements for comparison purposes

Company B, Company S

- Company B is significantly bigger (Big company Starbucks)
- Company S is small (Peet's Coffee)
- Big company will have a big cash account but it is NOT necessarily financially healthier
- The sizes of the companies are different and the absolute normals are misleading us

Standardize financial statements

- Obtained through the regular financial statements
- Just calculate percentages
- You need to look at total assets and calculate the percentage of each account according to the amount of assets that they have

Current Events

- Seasonalities
- Most of their stuff is sold during Christmas time
- Compared to the last time Christmas happened, we check how the revenue compares to that.
- **Revenue should be compared Quarter to Quarter i.e. Q1 2016 vs Q1 2017**

3.1 Financial Statements Analysis

- Common-Size Balance Sheets
- We need to make sure the companies are in the same industry
- One of the friends asked about high-inventory

3.2 Ratio Analysis

- Look at companies internal financial situation over time
- What % of total assets are in fixed assets
- How does this change over time?
- Why don't you look for the past 5-10 years and see the trends.

Comparing Liquidity Ratios

- Can this company be trusted to meet its obligations

Q. For a retailer, the current ratio and quick ratio would be different from each other?

total assets = total assets + fixed assets?

- When interpreting things, try to understand the context and for a startup company, we would put everything we have on these fixed assets

Q. Why don't you compare the same theory and a startup company would have less data and it is harder to understand.

- If you don't have money, go to the cash flow statement since it has to come from somewhere
- Ponzee scheme - you borrow money and you are doing something with the money

Current Ratio < 1: then your money comes from somewhere
- Does this mean 100% bad? Let's look at the case and see what the company is doing with this money.

Computing Leverage Ratios
- Each can be derived from the other

We have a high turnaround business like the finance sector - comfortable in borrowing money and paying it back
- Debt/Equity ratio depends on what is good and what is bad.

In finance, the optimization of that ratio takes up a lot of space. People have worked on it a lot.
- The way the incentives are set up in U.S. financial areas, if you borrow money, what is the cost of that money to you?
- It is a cost item and can I take that off as a cost item in my statement.
- Would it make your profit smaller?
- On the face, there is no cost to issuing stocks (shares)
- You have to maintain the health of your stock and make investments to keep your stock as an attractive alternative.
- Costs you incur for funding your company with stocks is not tax-deductible.
- All of these incentives determine the companies debt/equity ratio
- If you borrow money, at what rate?
- Apple borrowing money and they can write off their interests as costs.
- They can borrow at a low cost. Writing them off from their income statement and these considerations will be determining the optimal debt/equity ratio.
- Leverage you get by borrowing money - having debt is not necessarily a bad thing.
- If you are in a situation where the market is right, people borrow money

0. If your operating cash flow is high, and the market for your product is really good, do not shy away from borrowing money.

- When we talked about lining the agency principal's interests
- Business can grow with the leverage of debt
- Operating cash flow, no debt, too timid
- Good candidate for takeover

- In situations where debt is very small, that kind of company will be a good takeover.
- Financing is too timid.

- If we don't have any income, we don't pay any taxes.
- Some industries

Amortization - the depreciation of your intangible assets i.e. patents
- With cash that you have, it is the cash coverage ratio

Q. If you have continuous inventory, how do you account for that?
A. This is an approximation and your inventory is changing from day to day.

Q. What if it is a service company like Uber?
A. It is a beautiful situation and we need a new way of keeping up service at bay and keep things in demand. Dynamic prices system. Car is $21,000 and at the end of the year, it goes down a bit.
- Very dynamic price algorithm - it is written right here by a UCLA economist

If you are turning over inventory 5 times, then it is going to take 63 days to sell your product.

Inventory level - I am looking at things at this level
- **Look at the same period from previous years**
- What does it mean?
- 3 things
- The demand for your product is going down.
- There is nothing with you, the industry is in bad shape. (Industry level clue) - macro level i.e. Great Depression
- The Central Bank looks at the inventory a lot
- They want to know if enough firms are having inventory buildup.
- What does this mean? The economy is slowing down and people are buying less stuff.
- If people keep on not buying stuff, firms cannot sell stuff.
- They are going to reduce production by firing people.
- Let's pump money into the economy and reduce interest rates
- Borrow money and buy shit. Good indicator of what people want.
- Structural change in the industry
- Flip phone -> smartphone

- Even if you have a big dataset, you just need the interface.

W 4 (Aysan) Midterm 1 Review Session

- **Inventory is easier to become accounts receivable than liquid**
- You don't have any customers at this point
- You haven't received the money but you have the contract
- You have to be able to argue if a company has a great cash but you have to be able to argue it.
- If one ratio is small, the numerator is either too small or denominator is too big.
- True/False needs at least one line of explanation
- We are not black and white, you might get half a point, which is better than not receiving anything

Current Ratio = Assets_current / Liabilities_current

- You can write things and try to find relationships between two unknowns and try to find one of them

Quick ratio

- Cash ratio, how much of it do you have right now
- If right now I have to pay all my liabilities, how much do I have to cover
- Other times, you can only cover a little bit

Long term solvency ratios

- How much of your debt you can finance from your available resources
- Play with ratios as long as you are familiar with the concepts and you know the balance is the cash flow and the balance sheet.
- Don't talk about reality; in theory, they should all be balanced

Debt-Equity Ratio: Transfer your debt and find out how much assets you have.

Equity: How much debt you have vs how much your company is worth

- You can increase equity and sell more stock

Coverage ratios

- Depreciation and amortization is NOT a cash flow
- **Amortization**: The depreciation of your intangible assets
- Can you find amortization on the balance sheet?
- Possibly
- NOT actually a cash flow and that is your decision
- It becomes 0 and as a company, you can decide your depreciation every year.
- Decrease your tax as well as decreasing your net income

Asset management ratios

- Ratio of inventory turnover: How many times you have emptied your inventory compared to cost of goods sold
- This is average; NOT always true!
- What we want to calculate may take 100 days once or 110 das another time.
- We just want to find an average to decide and form as strategy of buying and selling

Q. Which of the following are advantages of the corporate form of business ownership?
A. Limited liability for firm debt
Ability to raise capital
Unlimited firm life - corporations are easy to transfer to other people
- Sole proprietorship becomes part of you as a person, not a separate thing

Q. Is there any point when a sole proprietorship has to become a corporation?
A. You need 500 shares and $10 million in terms of worth

Q. Sole proprietorship just means you own everything yourself?
A. You can have shares and if you want to do that, and you reach the max cap, you have to go public. Otherwise, you are NOT public but you are NOT a sole proprietorship

Agency Problem
- In short term, I am manager but I want to grow.
- Sometimes directly, I will make decisions which means growing without risking how much decision it is.
- If I have too much of a risk, I am not taking that option because I don't have a company

Balance Sheet (Assets = liability + equity)
- Keep them separated (left and right)
- You might have to write a balance sheet necessarily
- It is in terms of liquidity (more liquid at the top)

Q. What is Goodwill?
A. NOT important!

Q. How is Accounts receivable less liquid than Short-term investments?
A. We sell something and someone owes some stuff to you. Short-term investments can be one month or two months.
- Accounts receivable is within one year.

- If I pay 20% dividends, how much is the % of retained earnings of net income?
- 80%

- If it is constant from one year to another, how can I find out what is the retained earnings?

Income Statement

- Order matters for turns
- How much do you have as your gross profit and the cost of your actual sales.
- This is how much cost it is for me and how much I sold it for.

Gross profit - pay for indirect cost and we cannot directly say that this much of research I have put into something else

Income Statement Analysis

- You my NOT have received your sales and it may not be directly cashed
- You have to have it so that your expenses and sales may NOT directly receive what is under your revenue.
- Net income does NOT correspond to cash and we have non-cash items we have already talked about.

Standardizing financial statement

- What am I doing in terms of size differences?

Example

- **WILL NOT HAVE DIRECT TAX CALCULATION**
- **Need to know difference between average tax rate and marginal tax rate**

Q. Could average tax rate ever be higher than the marginal tax rate?
A. It depends where into the bracket you are. You have to go for marginal tax

W 5 M Lec 2-6-17
Average score was 84 on this midterm!

Poll: If you know the debt-equity ratio, then you know the equity multiplier is?
A. True

Current Event Discussion

- Figuring out how to manage all the drones was challenging.
- At least 5 companies are coming out of UCLA that use drone technology right after the regulations are figured out
- Assess the building and figure out the risk level for the building
- Nothing you can say in this case.
- Structural engineer would clarify that.

- Apple got a big boost in its stock price after its Q1 announcement

- If people are shareholders and they don't like what you are doing, they will decide how to vote and if it is dispersed, there is an activist-investor community that sends information to all the shareholders give you the right to vote for you.
- Providing limited liability for the owners and suffering from double taxation.
- States that wanted to attract business to a land said to create different business forms who use different advantageous parts.
- Limited liability and no double taxation
- Snapchat at the end will be a big giant corporation

Poll: I am a retail business and I do most of my sales in 4th quarter. I look at my inventory number at the end of the year and calculate my inventory turnover according to my end of the year numbers. I was expecting a good quarter so I produced quite a bit. I calculated my Inventory Turnover ratio to be higher than my average. Is this bad or good information for my company? Higher than my last year's Inventory Turnover.

Computing Receivables Ratios

- Accounts receivables were recorded in a balance sheet, and at this point in time, there are $2 million I need to collect.
- $12 million of sales are made throughout the year
- If I take the total sales number that I achieved within 1 year and I divide it by Accounts Receivable, I get the Receivables Turnover.
- Of all these sales, if I divide it with the amount to be collected, it gives me **how many times I collect receivables within one year**
- You want high sales, low receivables
- Where do you get sales numbers?
- In your income statement, it comes from all sales!
- All sales are recorded!
- Am I overestimating or underestimating?
- If I divide credit sales, I will find that number, and 5 times I collect the sales I make on credit.
- Even though receivables ratio is defined like that, you should put different sources like this.
- For the Group Project, it is important to analyze the financial situation of your company and different sources define different ratios differently.
- Be able to talk about Receivables Ratios because of this reason and why don't I look at how to define these ratios so I can interpret them correctly.
- Turning over things 5 times will take 63 days to collect my debt.
- The debt is the amount of money that the creditors owe me because of the sales that I made on credit.

Q. Are sales on credit delineated on the income statement?
A. On the explanation form, you would find them, but generally accepted accounting principles (GAAP) says that you have to include all sorts of sales you make.

- This is a good point to talk about the following.

- Companies, especially public companies, are very aware of how investors are monitoring their ratios.
- Imagine you are startup and you have investors who put money on you and they would like to track your numbers.
- Whatever information you provide means they will be assessing your performance.
- Put down your sales even if they are not collected yet
- Give projections of the coming quarter's sales numbers.
- **If they don't like the sales number that is projected, you borrow from future sales!**
- Immaturely discount stuff!
- Sales number or accounts receivable can be an overestimate or underestimate of the average.
- Company may be engaging in fire sales or borrowing from future sales
- Analyst should be aware of that and look at trends to see if there is anything fishy going on.
- In terms of accounts receivable, it may be a better idea to look at an average.
- Introduce the sale and the sales started to come out and accounts receivable shoot up.

Computing Total Asset Turnover
- It can be bad because maybe your assets are depreciated
- A big chunk of money from your company is going out because you have to replace those assets
- In that sense, it can be bad, but you would expect it to be good news.

Computing Profitability Measures
- Profit Margin: when you look at the profit margin, you will be able to tell if there is a problem in a company's operations or finances if the Profit Margin is very different from competitors.
- Important number that people would pay attention to.
- Anyone loaning or working for the company.
- It would be a good idea to look at financial.
- Can tell you valuable information that may be necessary for you.
- Return on Assets (ROA): What is the profit you are bringing in?
- Kind of like the total asset turnover and for every $ in assets you have, what are the total sales you are creating?
- Return on Equity (ROE): For every $ invested on you, how much profit are you bringing in?

As an investor, I care about the total profit they have, so it is possible they have a low margin but they serve a lot of sales.
- Pharmaceutical companies may not be able to make enough to get a good return on investment even if they do sell their drugs at an expensive price!

- You better have a high profit margin on the one you are selling in this case!
- From Costco or similar retailers, because they have low profit margin, any inefficiency in their inventory needs to be sold.
- Perishables should be managed well and moving stuff should be managed really well.
- If you can manage these aspects of the company, it will be a huge improvement.

ROE

- To be able to earn this profit, you have this much equity, but to get to profit, what do you need to do?
- Make sales and collect profit, starting from the equity
- If there is a problem from my ROE, where does it come from?
- Me not having enough assets or NOT creating enough sales/asset $
- NI / Sales is your Profit Margin (PM)
- Sales / Assets is your Total Asset Turnover (TAT)
- Tells you how much sales you are creating
- Equity Multiplier is Assets / Equity (EM)
- How much leverage you have and how much money you are borrowing and making those assets
- Use logic that the company would employ by collecting money and making profit

Let's say your ROE is low. Decompose it and if it is comparable to the market, look at your Total Asset Turnover (TAT).

- If it is low, am I going to be in a disadvantageous situation when looking at the industry?
- If I have the same profit margin and the same asset turnover, we can create less return even though for every $ in assets, we create the same amount of sales.
- Our ROE will be less, so what does this indicate?
- Is the company financially well-managed or not?
- It is NOT financially managed well. The company is too timid of getting into debt.
- The other company can manage its debt well and when you get into debt, you pay it back.
- When you pay it back, it is a cost item which will reduce your profit.
- Competitors are borrowing money and producing the same amount of profit margin even without financing costs.

Debt 101 to would-be financial managers

- It is a good thing if a company has high ROE
- How do you get your ROE high?
- Make your profit margin higher than before
- Increase asset management by increasing your Asset Turnover

- Get into debt and pay a high cost for your debt and reduce your profit margin.

Some companies just don't want to get into debt

- We had a big firm and a small firm (Starbucks vs Peet's)
- Peet's doesn't want to get into debt and they are NOT as big as Starbucks

If a company is a well-established and mature company that is NOT growing, this means the sales are the smallest from year after year.

- Serving to the same amount of people year after year.

Poll: Earnings Per Share is defined as profit (net income) by number of shares

- PE Ratio is a very important number for investors to follow.
- How much value does the market put on your stuff when the profit you are producing per stock is this much (earnings per share).
- Which would you prefer to invest money on? High PE Ratio company or Low PE Ratio company?
- Low because the stock price is not overinflated.
- If it is too high per profit, there is one more piece of information here.
- This is already inflated! I want to invest on
- It could be both, it depends how you see the company!
- Look at the potential of the company and what the millenniums want to purchase
- If it is low but has potential to get big, buy it!
- If it is high and is growing, buy it!
- P/E ratio: Check this for FB, Amazon, Walmart, IBM, etc.
- Look at high-growth tech companies' P/E ratio
- P/E ratio for a high-growth company can expected to be higher
- Amazon is probably higher than Walmart's!
- Started to produce profit only relatively recently.
- Need more information to decide which one is which.
- Is it hype or positive future potential?

Poll: For a company that is a tech company with high intangible assets like future potential that you cannot show in the balance sheet, will the Market to Book Ratio be high? True or False

Getting harder and harder to define industries now

- Google: Produces search engines, software such as Google Docs, Google Earth, etc.
- What industry are they operating in?

Potential Problems

- Benchmarking: that is hard to establish and it could be difficult from time to time.

- A company could be doing so good in an area that it is compensating
- Profit margin is low but asset management is so good and we get high return for investors.
- Knowing what each ingredient tells is the way to go with ratio analysis

Firms - companies are going to use different accounting terms
- Depends on your start and end date or comparing across different countries
- You can also have accounting complications

3.4 Financial Models
- No matter how hard you try, you cannot grow your profit unless you invest on assets.
- What do you need to invest on assets?
- **Money!**
- I am going to grow and what kinds of assets do I care about?
- I am Tesla and I want to grow.
- I need batteries!
- Will I get into a contract with Samsung or should I build my own.
- How do we grow a company and what ingredients are needed to grow it further and further?
- If I am making money, and I want to grow, then such a company would never distribute that money.
- What is the limit of my growth level?
- What is the maximum percentage of growth level that I can achieve here?
-

W 5 W Lec 2-9-17
Extra Credit: If a company wants to increase its sales, then its short-term debt spontaneously needs to increase with sales? True or false?
A. True

W 6 M Lec 2-13-17
- Slight overlap between ENGR 110 and 111
- Time value of money formulas from 110 and 111 will be identical
- It is a good idea to attend anyway to refresh your memory to your new context.

Accounts Payable is a part of it and when sales increase, when people want to produce more stuff.
- Answer is false because short-term debt is reserved for Notes Payable in finance
- Debt in specific terms is about borrowing money and when you are talking about the balance sheet stuff, it is referring to total liabilities

Difference between Accounts Payable and Notes Payable?

- They are both current liabilities (pay them back within 1 year)
- Notes payable is actually money that you borrow and you have to pay it within one year.

Online Poll:
1. Compounding daily would produce higher future value compared to compounding monthly.
True
2 External Financing Need arises when the spontaneous liability increase and internal funds coming from projected sales do not cover the necessary increase in assets.
True

Q. What would be an example of accrued expense?
A. Utilities! Monthly bills as well.

Q. Accounts Payable are only the supplies used to make the product?
A. She hesitated to respond because there are some cases where this isn't true.

Another Financial Planning Example - continued
- With $3,000 worth of assets, we create 300% of sales per year
- I want to increase my assets
- If you are increasing your sales, you need more supplies and accounts payable will increase the same percentage as sales increase.

Q. Why not issue stock?
A. You have more tax benefits if you get into debt.
- Apple getting into debt if rates are low
- **Issuing stock is expensive!**
- **Borrowing debt is generally cheaper**
- Issuing stock is expensive out of pocket
- Find Goldman Sachs, Merill Lynch and pay money to those guys to do it

All the information is integrated into your stock price and what happens in the future is integraated into the stock market right now.

The money going into your retained earnings is already taxed and dividends is going to be paying a 2nd tax

- Dilution: If you include more shares into your pile, then stock values get diluted

Q. What do you do in order to not hurt the existing stockholders?
A. Don't piss them off and issue new percentages, little by little.

- These new companies are selling stocks with no voting power (Snap, Facebook)

Company doesn't want to reintroduce stock but not buy new stock.

- A company is trying to grow and wants to repurchase its own stock.
- The company ay not think the market is valuing their stock at a fair price.

Percent of Sales and EFN

- Relationship between level of growth and the amount of money I need?
- You can!
- The first part of the formula indicates the change in the LHS of the balance sheet
- The first part indicates how much Assets need to go up (Assets/Sales)
- Second part is (Spon Liab/Sales)
- The company policy said we keep 2/3rds in the company and that is called the retention ratio

Keep in mind that none of this is set in stone.

- Increase my sales by 10% and I want to know what my External Financing is doing
- Profit margin must stay the same from year to year
- Company policy of distributing dividends must stay the same (D)
- Tweak and use the new dividend payout ratio to find a correct number

The Sustainable Growth Rate

- Companies try to grow based on Debt/Equity ratio
- Why don't we keep that ratio the same since we know there is some benefits to debt and if we can borrow it at good reasonable rates
- Instead of Return on Assets, you use Return on Equity
- Keep Debt / Equity ratio the same as before

Look at the change in one year's revenue resulting in a change in retained earnings

Determinants of Growth

- How much of the sales are you keeping within the company
- Total asset turnover - asset use efficiency
- Financial leverage - choice of optimal debt ratio

Future Value

- Initial amount and the rate at which it grows for that period
- Whatever that period is, the future value is $10,500
- Having $10,000 is exactly the same as having $10,500 in one year
- This equivalent amount depends on the rate

Present Value

- They tell you to give you $9,500 and I'll give you $10,000

- In the market, you could make 5%, so do you take this deal?
- You get less money than the value of $10,000 worth to you today.
- I get $10,000 in one year, so I cannot add and subtract stuff with the same sign for different time periods
- We discount things with the alternative you have in the market.
- The alternative I have in the market is the price.
- To borrow money, you need to pay interest!
- To be able to add and subtract stuff, look at the cash values and say I need to convert you so you belong to the same exact period.
- The value of this today is higher than its cost, so I should probably take this deal

Effects of Interest Rate on Tail Heavy Cash Flow
- Look at interest rates and find values of these two bonds
- When I want to sell it, the people going to buy it will be doing the same kind of calculation
- If the market believes that is the case, then there is no opportunity

The only concept that Mel wants us to get is
- Look at cash flow. If amount you are obtaining in cash flow is higher than in the future, then the tail heavy one is going to go down faster as rates go up.
- **All things being equal, if cash flow is tail heavy (meaning it offers more later)**
- **It will lose more if interest rates go up!**

4.3 Compounding Periods
- 12% borrow money - $1,000 and at the end of the year, you will be paying $120 if compounding is done annually
- If you borrow $1,000 at 12% per year (APR) and if you are paying it at the end but the compounding is done monthly, then you will be paying $1,126.08.

The later the tail end of the cash flow, if you look at the denominator, it will have a higher denominator
- If that tail is higher, then you re discounting a greater number
- Divide by a bigger number and that's all there is to it.
- Evaluations of all sorts of assets look at rates, so she cannot just surprise the markets; she has to ease into it.

Q. Isn't the market rate more what you would get in mutual funds?
A. Fed is macroeconomics, while interest rates is a macroeconomic topic

- Give them money and say "Keep my money, safely."
- They end up with a bunch of money and they say what should we do with all this money?
- Let's look at the average money being thrown.
- Loan out the remaining to people, but pay me interest!

4.3 Compounding Periods

- If the yearly rate is 12% and you calculate the future value compounded more frequently than yearly, you have to see the compound period!
- If it is monthly, divide by 12
- Semi-annualy, divide by 2
- Weekly, divide by 52
- Daily, divide by 365
- Quarterly, divide by 4

Annual percentage they must have must be higher!

- This rate is called the effective rate of 12% semi-annually compounded information
- More frequent compounding is going to be higher.

4.4 Simplifications

- Easier to think in terms of these simplifications and let's introduce 4 formulas to use.
- They come in uniform ways
- You have a cash flow that asks you to pay a certain amount fix

Perpetuity

- Ailing CEO and you want to leave your company to your kid per year forever.
- Corporations live forever and owners are going to be changing down the line.
- Get $100 million per year, every year, forever
- How much money do I need to put aside right now if I know that money can make 10% in the market?
- Is it an infinite amount?
- How do I calculate it?
- Value of this thing will converge as long as your r is less than 100%

W 7 W Lec 2-22-17

- Net Present Value quantifies benefits and costs
- Use this idea to evaluate the value of any project
- Treat the various cash flows by discounting them and arriving at the net present value number
- Estimating NPV:
- Figure out the cash flow
- Might be difficult because benefits and costs may be very hard to quantify
- When it comes to the intuition behind the discount rate, we have to have a good idea of what discount rate to use per year.
- Make a comparison that is hidden in the discount rate.
- We are comparing cash flow with the ability to make money at this rate

- Minimum Acceptance Criteria: Accept if NPV > 0
- Ranking Criteria: Pick the highest NPV project

Why Use Net Present Value?

- Accepting NPV projects will benefit shareholders of a company.
- If you are doing something better than your best alternative, this means that this money is doing better here than what it could do elsewhere
- Shareholders look for NPV positive projects because it will increase the value of the company
- Compared to other methods, you are considering the **entire project**
- Addressing all the different aspects of the project.
- Treats the value of something coming in 5 years from today differently from something coming in tomorrow!
- Easy to calculate and it is easy to use in production/industry

Disadvantages of Net Present Value

- We are going over some of this project evaluation and go back to this.
- We are looking at a cash flow and trying to understand if a project is good or bad.
- What do we rely on on?
- **The cash flow**
- **The discount rate**
- What can go wrong with NPV
- Use NPV because it is so praised in industry and can give you a false sense of security.
- Suppose you graduated and you see some projects
- Ask the question that would make investigation between the lines easier
- How did you come up with the cash flow?
- What discount rate did you use?
- Is that why you discounted cash flow at this rate?
- Do NOT forget how ingredients are calculated.

The Payback Period Method

- What is the initial cost of this project?
- $1000
- How many years does it take to recover the initial cost?
- The amount of time it would take to recover the initial cost is the payback period number
- Takes us 3 years in this example to recover initial cost
- If it doesn’t round evenly, assume the money comes uniformly throughout the year
- 600/800 = 3/4
- For comparison, accept anything covering initial cost in the least amount of time
- Need to take into account the cash flow has
- Value of $200 right now is less at the moment

- NOT recovering the initial cost

Problems
- NOT considering the cash flow
- NOT paying attention to the time it takes!

For me to evaluate this manager whether he is doing a good job or not, I need to see if the project actually occurred or not.
- This project could recover the cost is X amount of months
- Upper management is using payback method to keep track of lower and middle-management.
- Use this as a tool to evaluate how efficient the lower management is in making short-term decisions

0. Mathematically, we agree, this doesn't make sense compared to NPV
- If you know cash flow and time value of money, use NPV!
0. Use this when you want to get your hands on cash as soon as possible (especially for young companies) and you can use this as a tool to evaluate your managers to see results of their decisions

- How well is this guy or gal evaluating the situation coming in front of her?
- Use this to keep track of the accuracy of these decisions
- NPV is cash flow that is coming in a long period of time even with changes in a lightbulb.

- Minimum Acceptance Criteria is arbitrary and set by the management
- Ranking Criteria is also arbitrary and set by the management

Disadvantages of Payback Period Method
- Arbitrary acceptance criteria
- I know about as much as I know about ethics
- A project accepted based on the payback criteria may not have a positive NPV
- **NOT all cash flow is considered**

Q. **1) A project accepted based on the payback criteria may not have a positive NPV.**
A. True

Discount rate - that $5 million may or may not come in
- In the expected value terms, I probably won't get $5 million
- How can I remedy that?
- Put the cash flow and let's apply a higher discount rate than the one with a risky situation
- I expect a higher return from you unless you promise to give me $8 million three years today.

5.3 The Discounted Payback Period

- Payback period had negative aspects and we wanted to acknowledge time-value of money and why don't we consider an upgraded version of the payback period method
- This is the discounted payback period method
- Instead of recovering initial cost

- Will it take 3 years or longer to recover the initial $1,000?
- It will take longer as long as the market rate is positive
- The discounted payback period will be longer than the payback period as long as the discount rate is positive.
- With this method, we are trying to recover the initial cost and what I could do with that money in the market
- Recover what I put plus what I could do with you.

Q. How does discount rate relate to NPV?
A. By discounting this stuff, we are trying to pay attention to the time value of money.

- Discounted payback period, we aren't considering cash flow coming down the line.
- **Specified time: arbitrary given to us by upper management**
- **If you can recover initial cost within a certain time, you are good!**

5.4 The Internal Rate of Return

- If, in the market, I could make 10%, should I pick this project?
- Yes, it gives me 20%!
- If you evaluate the NPV at 10%, it would be positive, so when you find IRR, the rate you find there should be the rate you compare to market.
- The way to find IRR is set NPV to 0 and find the rate.
- Borrowing type and a low rate vs. high rate.
- We discuss all of these aspects and the textbook go into detail.

- Find sections that are related to IRR

Q. When calculating NPV, they will give you rate of return. Would another market rate be given that is different from the rate of return?
A. In any case, you have a benchmark return and how do we use that benchmark to discount stuff.

- Figure out rate of the market and if this rate is this, here is my benchmark and how do we compare?

Comparing the rate of return to the market

- Investing vs borrowing

IRR: Example

- There are some limitations that we discuss in ENGR 110

5.6 The Profitability Index (PI)

- Last project evaluation method
- For every dollar I am investing, what is the amount of money
- Minimum Acceptance Criteria
- If PI > 1, accept **IF your project is independent from other projects**
- If you have $100 and you can do this or that, but not both with your money, then this criteria may lead you in the wrong direction

Using PI on Mutually Exclusive Projects

- You cannot pick A and B at the same time
- You are bidding one against the other
- **Under any circumstances, NPV will always give you the correct answer**
- Let's assume the opportunity we had elsewhere was @ 10%
- **You generally want to pick the higher NPV, but what if PI is lower?**
- If you can extend the second project, then the second project would fare better.
- How could I resolve this unreasonable contradiction of numbers.

Look at this and look at the extra money ($30) what you could do in the market.

- Decompose the bigger project (A) into two: Whatever the other project (B) is offering and the remaining balance
- Take the difference (A - B)

Looking at different project evaluation methods

- In military, profitability index is heavily used
- Good qualities - for every dollar I invest, what is the dollar amount I return
- Good intuitive evaluation method

Q. If PI_(A-B) < 1, does this mean NPV A is less than NPV B?

A. True! If I got PI_(A-B) < 1, then NPV A < NPV B.

- **These are interchangeable! Results of NPV will agree with results of PI**

When you take the difference, you get whatever cash flow over and above

- You should pick the small project and put it in the market because it will make it better

The Profitability Index

- Whenever the budget is limited, you want the highest bang for your dollar

When companies are deciding to take on a project or not, you pay attention to several things.

- What are the methods you use to evaluate the cash flow we have in front of our hands.
- How are we going to come up with the cash flow?

Let's assume we are introducing a new product to the market.

- What is the cost and depreciation?
- What is the bottom line that is left and all of these things we need to pay attention to.

Toyota Camry - best selling sedan in the U.S. and when they come up with the hybrid version, what would this do to existing Toyota Camry sales?
A. Erosion in other parts of business.

- Must be included cash flow in the business
- If there are erosions, you must include that.

Cannibalism - iPhone is killing iPod

- Introduction of one product kills off another product
- Include cash flow for this as well.

W 7 Dis 2-24-17

- If you don't know something 100%, don't write it down
- The question tells me that all my assets are increasing at 25%

Net Present Value

- If the question tells you to find NPV of cash flows, then it will be positive
- If they ask you for NPV of the project, then that is more challenging.
- Everything is an estimate and there are shortcomings and it is good for us to know

Ex 1

- If you receive monthly payments and it is compounded monthly, then you would do APR / .12

Ex 2

- The i is a result of the month
- Long term cash flow == perpetuity

Payback Period

- Makes it easier if we don't look at time value of money
- Pros and cons and what if a manager really does prefer one project over another

W 8 M Lec 2-27-17

- Kevin is giving a review session tomorrow at 6 PM

- Coverage from the 1st midterm on
- There are concepts you need to know from 1st midterm
- Growth rate and financial ratios
- If you just read that part and forget about the first part, there will be a continuation of topics in order to answer these questions
- Last quarter's exam was posted
- Some bond questions at least with some equations today.
- We have covered chapters 1 through 5
- Review the last one and a half weeks

You can have a formula sheet
- One face of 8.5 x 11 and do not put any solved numeric examples!
- Graphs, numeric equations, definitions
- NO solved examples!
- Start doing work on the group project

Erosion
- One product is causing the sales of another product in the market to go down

Cannibalism
- Company has to kill one product to sell a new product
- iPhone killed iPod

Capital Budgeting is referring to what kind of cash flow?
- Introduction of a new product to the market will not only affect the direct costs, but also the indirect costs
- If you are introducing a new product and expecting it to be A dollars, that isn't the only cash flow relating to the product.
- Reduction in revenue in the sales of another product should be included in the cash flow
- Consider the with vs. without principle
- If there are any spillover effects, these should be included in the cash flow of this project.

Synergies
- Possible that introduction of new product will cause the sales of another product to go up

Q. Some of the things you are talking about is intangible. How to classify this?
A. Cost side is more or less easier. There might be unforeseen things and suddenly, the iPhone is starting to blow up.
- Benefit side is harder to estimate because it involves demand.

How do you find a method to make the demand in the market for your product concrete?

- Evangelists
- People who adopt your product first and there is a relationship between if the evangelists are this much, then this refers to a total market for this product.
- Virgin Galactic
- Future astronauts going to outer space
- People who signed up to go to Mars and not return
- It better be this!

If something better comes along, we will be killing it.

- Look at sales and these are all projected numbers.
- Nobody purchased anything yet.
- Established and created methods with 4 years of sales numbers and we are estimating our costs for those 4 years.
- Initial investments can be equipment, machinery, or some fixed cost.
- Shown as $16,000
- Depreciates down to $0 in four years.
- We want to cover the general case where the machinery does not depreciate down to zero.
- **We are making this calculation at time 0, and if we are projecting the market value is positive in the future, this should be included in calculations**
- At the 4th year, sell this thing and take away the tax you need to pay because the market value is higher.

Market value < book value means loss

- The book says I have this value, but the market says I don't, so I am at a loss
- Negative and negative gives you positive, so you might get some tax benefits (lower taxes) at this level

Q. What is the market value?
A. You are making all these calculations at Year 0, and you want to see the value of introducing a new product to the market.

- Must have some projections or else you are paralyzed

You are going to be having a ballpark number for that market value

- Book value you are more or less determining
- Depreciation is a ghost, fake account where you are trying to talk to your accountant and come up with a good number to minimize your tax liability
- Use account wisely because it will directly affect how much tax you are paying

Q. Is the market value at the 4th year or Year 0?
A. Project everything at Year 0

- Get some tax benefits because the book value is higher than the market value
- Salvage value will be higher than the market value

Q. What are tax benefits?
A. In income statements, you have revenues, costs, depreciation, tax, income

- You pay tax!

- The market value is 3,000 and the salvage value is 4,000, so it goes into income and you get taxed extra
- It goes into your income statement as other income because it is NOT basic operations

Q. Why does the government provide tax benefits in this case?
A. Ask the government! She can go over the math but not the tax benefits

In any kind of loss in any situation, then you can write that off from the income that you have.

Q. Do you calculate salvage value each year?
A. It is only when you get rid of it.

- You want to maximize depreciation to lower your tax liabilities.
- Each year, you can optimize and change the depreciation.

Introduce a new product to the market

- We get the estimates for the sales as such
- We are more confident because the cost side is under our control and we are more confident over the costs.
- More to this depreciation business and this is motivating you to think what this depreciation is about.
- Law allows them to pick different depreciation methods
- Look at the allowed methods and try to optimize the tax liability by picking that depreciation methods

Look at the cash flow

- Everyone knows that net income profit is NOT the same as cash flow
- We have a net income and the operating cash flow and this is $4,000 higher than that
- For the first year, we have $5,716
- Net working capital needs to come from somewhere
- Investment on net working capital
- We need to come up with a value on net working capital

Either net working capital increases once, or it is increased throughout

- These are projections for this particular project

Q. What may be the reason for increasing NWC?
A. Since NWC is change in current liabilities - current assets, then we are increasing our inventory because we want to make more sales

We don't pay anyone $4,000 per year.

- Keep the questions so we don't have any bond questions
- Decide on the cash flow for the project

If there is a salvage value, we need a salvage value at the 4th row

- Incremental cash flow
- Increment over our operations so far
- Where is that capital cost?

Sensitivity analysis looks at NPV

- One variable has more effect (importance) compared to the rest
- Everyone has limited resources and make sure to get this number correct
- Especially if you have limited resources

Example: Steward Pharmaceuticals

- Production will occur over the coming 4 years
- Introduces a new drug to the market

Parentheses means negative in accounting

- (3000) means negative 3000

Q. Is sensitivity measured overall or per year?
A. Overall, BUT obviously, if you are a company who is undertaking a huge projects, you could do the following.

- If the opportunity cost in the market is high, which is more important, the market cost at the first year or the fourth year?
- **First year**
- Get it right early on!
- Put the variable costs as different here from the following reason
- How many units do I need to sell to break even?
- If I remember my income statement, fixed costs are written here and we made a distinction between costs of goods sold and selling administrative costs

Whatever has the highest percentage, we want to pay attention to that the most.

- Let me only affect revenue!
- It usually doesn't happen that way and several my numbers will be affected in one way.
- Defense investment is going to go up by 9% for Northrup Grumman
- Imagine the NPV of that company right now with the change of scenario
- Increased investment in defense will affect all sorts of numbers right now.

Scenario Analysis: Steward

- Get as much perspective on their numbers as possible
- Something about FDA approval is important for the company.
- Calculate the NPV and look at each scenario.

Mel was in the Federal Reserve when the First Iraq War began

- Understand how the interests rates would change and what kind of effect would this have on the economy.
- Scenario analysis not only accounted by firms but also government agencies.

Chapter 1-7 except break-even analysis

ENGR 111 Midterm 2 Notes

You can also compute the gross profit margin and the operating profit margin.

GPM = (Sales – COGS) / Sales
OPM = EBIT / Sales

Profit margin is one of the components of the Du Pont identity and is a measure of operating efficiency. It measures how well the firm controls the costs required to generate the revenues. It tells how much the firm earns for every dollar in sales. In the example, the firm earns almost $0.16 for each dollar in sales.

Note that the ROA and ROE are returns on accounting numbers. As such, they are not directly comparable with returns found in the marketplace. ROA is sometimes referred to as ROI (return on investment). As with many of the ratios, there are variations in how they can be computed. The most important thing is to make sure that you are computing them the same way as the benchmark you are using.

ROE will always be higher than ROA as long as the firm has debt (and ROA is positive). The greater the leverage, the larger the difference will be. ROE is often used as a measure of how well management is attaining the goal of owner wealth maximization. The Du Pont identity is used to identify factors that affect the ROE.

Mel O.H. 2-27-17

- Growth rate and EFN
- Assets, liabilities, and equity
- Next year you want to know how it is going to look
- If you know the relationship between sales and any of these accounts, you want to impose those conditions on the balance sheet going forward.
- They are proportional and increasing at the same proportion
- % of Sales approach is good to start with
- Direct link to sales increase at the same percentage of sales
- If we increase revenue in income statement, this is reflected in Net Income
- This goes up as well and if we choose to retain some of it, it goes into Equity
- Internal growth rate is from ONLY your internal funds

Slope difference and figure out this idea

- Convince yourself why these slopes are different and why do they go at these points.

- Towards the end of the 3rd chapter

EFN formula - is the PM for current year or projected year?
- PM should stay the same
- Retention ratio should stay the same
- Company should not purchase any new stock

Kevin Review Session
- Limited Liability Company (LLC)
- A hybrid between a partnership and a corporation
- Assets cannot come after you
- LLC cannot have the preferential tax treatment that you get with a corporation

Standardizing Financial Statements
- Make it easier to assess a company as it grows, and to compare companies in similar industries
- Common-size Balance Sheets
- Compute all accounts as a percentage of totals assets

Test Yourself
- Facebook
- Profit margin is a huge increase!

In the textbook, the PM has to be constant and also the debt/equity ratio
- You just assume sales will be lost in your income statement and they will all be increasing by the same percentage

In addition to retained earnings, there is also what your long-term debt would be, and this is why you need a system of equations here

Annuity
- Constant stream of cash flows
- Get paid the same amount each period
- Simplify calculations and use these annuity formulas
- Divide this by (1 + i)^n

Payback Period
- Simple way of accounting for money and stuff like that

Financial Break-Even
- Equivalent annual cost

Stuff to put on cheatsheet

- **DuPont identities**

W 9 M Lec 3-6-17

- 6th HW is optional and if we choose to complete this HW, your lowest HW will be replaced with that.
- If you choose not to submit that, you won't lose anything because it is optional
- Probability distributions will introduce the following concepts
- The break even point
- Given the market information I have, how many market units will it take for me to break even
- Pay attention to break even point idea because the costs that are involved in the financial process are going to be paid today and the benefits are going to be collected over time
- Time issue into the picture means the financial and accounting break even stuff will present itself.
- If you pay attention to time, your break even might vary from if you did NOT pay attention to time
- Estimating cost items is usually easier than selling at some price
- Price is less certain than other items
- When would it be easier to notice the price of the product you are introducing
- If you take a survey, you will know who is consuming it
- You have a point to start from and you cannot charge $50 for a mile in Kentucky because that is outrageous!
- **Price is less certain than the cost side**
- Variable cost is more certain (economists differentiate between variable costs and fixed costs)
- Selling administrative costs and financial side does NOT pay attention to variable costs
- Changes with the quantity you are producing
- If you are adding another unit to your production pool, the total cost is a variable cost which is the cost that changes with quantity.
- **May be non-linear! The first unit you add is more than the 100th unit you add, possibly.**
- However, let's assume it is constant to make the demonstration easier
- As the name suggests, it is fixed so this should NOT be seen as the initial investment.
- Fixed costs refer to period costs that are set
- Fixed cost should be corresponding to the monthly fixed costs
- There needs to be a range so we are consistent within that framework and we need to adopt this for other durations
- If I am able to sell two units per price P, then the variable costs will be this much.

- Let’s say I am trying to take off and there is another company trying to do that already
- Let’s see what the other company is doing and if they are doing 1/4th of that, we have to sell 8x that much
- This assumes we can sell all the units
- We are trying to cover all the costs and we see an income statement and we have costs of goods sold
- For depreciation that we are asking, if we make our initial investment, it is NOT obvious!
- There may be a production process somewhere and 90% of your investment is gone in the first year and 10% is gone in the 2nd year and you are done
- Pay attention to this difference and the thing is depreciating so fast that I am taking that into account
- Allocate this accordingly since there is simplicity and keep it uniform

Accounting Break-Even Quantity: this could be more certain that you are selling a set group and I know the price.

- The price is determined according to market conditions, and I do NOT know the price.
- Can I calculate the break even price?
- In this case, everything is known except the price, which is your hw.
- **Calculate the break even price**
- How do we revise this formula to take that into account?
- Am I making the same amount of revenue?
- P * Q = Net Revenue

0. Financial Break-Even

- The quantity you want here, would it be less or more than accounting break even?
- In this case, **it is more because you are covering more costs!**
- If I would like to make more money in this previous case, will I end up with positive profit in income statement?
- **Yes!**
- Then, I will have to pay taxes

You have to adjust Opportunity Cost for industry

- Software industries have faster break even times than other industries because technology is the best!
- Boeing and Northrop Grumman (defense companies) have a much longer break even time!

If I invest the money on something else, and with that investment, I make $1400 a year for 10 years, how do I distribute this?

- Look at $1400 as my per year cost

Look at how many units for us to become profitable in the accounting sense, and how many units for us to be profitable NOT only in this business, but also for other businesses as well

- We are saying that if we sell 10,000 units we are introducing to this product, we are just starting to break even

Monte Carlo Simulation

- Draw from a probability simulation of something happening
- I know probability distribution over a certain range, but I don't know what number is going to show up
- Add a bit to do that in Excel

Need to come up with probability distributions

- This is why we have 2008 financial crisis
- One of the reasons it happened was that we became overly confident in the mathematical models that we had to calculate the values of the assets we had
- The numbers that are fed into these complicated models were incorrect
- We calculated this complicated model

W 9 W Lec 3-8-17

- Pick one variable and the rest, I have reasonable confidence and the lower bound for that item.
- Usually, a bond has a face value
- Amount to be paid at the maturity date
- Usually, the face value is $1,000
- This will get paid in 5 years (which is the maturity)
- Fixed values include
- Face value
- Time to maturity
- Coupon
- Coupon/FV
- It depends on what the market offers
- With that kind of offering in the market, this is the maximum price I will pay for this bond

Bond market

- If we see activity in short-term and long-term bonds, we can think about future rates and this is NOT completely linked by the end of this lecture.
- Prices will be affected in a more profound way
- **Long-term bonds are more susceptible to price changes and fluctuating price changes than short-term bonds**
- This is known as **term structure of bonds**
- Relationship between interest rates and prices on another

Term Structure

- GDP on average goes up, so this means on average, the rates will go up.
- We expect our long-term bond to be losing value over time.
- For this reason, long-term bonds usually offer higher coupon rates than the short-term bonds

Yield to Maturity (YTM) <=

- **Price of the bond value is NOT fixed**
- Changing all the time according to market conditions
- I am buying a bond and I don't know anything about bonds
- It will pay $100 each year for 5 years and then it will pay the face value of $1,000 in 5 years
- Yield would match the market rate
- Calculating the yield is higher than the market, and people will jump onto that bond in this case.
- **The bond price will go up, but the rate will go down to offset this!**
- Whenever there is something valuable, people will jump on that for sure!
- If a product is selling like hot potato, do you think that person will have a monopoly on it?
- NO! There will be a supply increase into the market and demand will go down overall
- Drive to get to a higher rate will increase the quality!
- This is human nature!

Coupon Rate

- All of these things are fixed - millions of people enter and your price is determined.
- When price is determined, yield is also determined!
- You entered your bid, got the bond and waited 5 days.
- Could we sell the bond at the same price?
- Probably not

Investing on Snap is much more risky than investing on Facebook

- Investment world is NOT closing its door to uninformed investors
- The long-term value will show itself and the randomness will eliminate poor contenders
- What discount rate would you use in the South African DJ example?
- You would use a rate that is comparable to that project.
- If you use a market rate that you would get in the U.S. and apply it to another project, it would NOT make sense!
- This is a risky bet!

Yield Curve: US Government issues bonds to finance expenses and municipal bonds as well

- We can see that the portion of the population takes part of things in the future.

- Because the treasury bond market is quite big, we can understand more about what the market is thinking about in terms of future rates.
- Just look at treasury bonds right now.
- New addition to this pool so it is possible this reasoning can be tempered one way or another

High risk bond means you would expect high yield!

W 9 Dis 3-10-17

- Start project and don't bullshit. Try to get some stuff solid during 10th week

Monte Carlo simulation

- We don't know the market and we are trying to figure out uncertain values
- Let's randomly assign and see how many times things occur
- When you have all the data, get the Net Present Value and find anything that you are asked to find and check random variables and randomly pick what is going to be the event

Ex. 1

- Round up because if I am even half a unit below, I won't make the break even amount

Introduction to bonds

- If you pay me money, I will pay you back
- Maturity: Your bond has some face value and from today until the face value, you may or may not receive some coupons
- You want to refer to the day you receive the Face Value or check when the company goes bankrupt
- They would give you a coupon rate and all these things will be there for you at some point
- Face value: The payment at maturity (aka the Par Value)

Pure discount bond

- **One payment at a future fixed date**

Bond value

- How do I find the value of a bond in terms of time?
- Net present value until they return the face value

Level coupon bonds

- Not always the same but could be more, could be less!
- Market rate most of the time is NOT stable and may change when they give you a bond and the contract if they don't default or go bankrupt
- As long as the economic cycle is good, they can keep the rate
- Depends on what the market rate will do

Level coupon bond valuation

- Bond value is related to how many coupons you are paying me + face value which occurs at the end of my maturity
- Coupon at the end of maturity will have a chunk of the face value and you can check if it is worth buying at a given price

Ex. 3

- Paid annually with a coupon rate and the market rate is the same.
- Coupon rate is going to substitute for your market rate balance, and this is the case if the market rate won't change
- This is subject to change
- To find future value, take time value from Year 0 to Year 20
- I have my face value the same and this 10% will cover the 20 years I have my money as a bond

Market rate

- Market rate is different from coupon rate
- If coupon rate < market rate, I have the opportunity to invest it somewhere else and receive more money
- **1 + c is coupon rate**

Ex. 4

- Receive something constant from them and now the market is changing
- You can sell your bond to other people but NOT necessarily to the company
- What is going to be the price now and what is a good move for me today?
- At a premium bond now, and depending on the price that I purchase, we look at the bond value
- You may purchase a bond at its bond value, but this is dependent on the market rate

Yield to Maturity

- You can validate things with the coupon you received and build off there

Ex. 5

- Find by trial and error on Excel

W 10 W Lec 3-15-17

- Variability around average return's stocks were more than those on the large company's bonds
- These were higher than the government bonds, so we looked at the variability around the mean as the standard deviation
- In arithmetic return, treat them as separate returns
- Take the holding period we had last time

Expected value of the portfolio
- Expected value depends on the weight and it ranges between 8% and 10% (because r_A = 8% and r_B = 10%)
- Why don't I put this on a graph to indicate the most important features that a portfolio has
- Return and risk are the two most important features
- In finding the risk level of the portfolio, we are trying to understand the volatility of the portfolio's return
- **Depending on the type of relation that you have in between the individual returns, it is possible that when one of them is increasing, the other is decreasing and dampening the overall effect**
- This is known as **diversification**
- If the risk levels are relayed in such a way they are negatively related, then they dampen each others' volatile effects and the entire portfolio becomes less risky.

I know how to calculate the expected return of a portfolio (y-axis of this line), so how do I find the (x-axis of this line)?
- Expected risk level of a portfolio depends more on the correlation (covariance)
- If two assets are moving in the same way, you are NOT obtaining the benefits of **diversification**
- That is going to have the effect of dampening each other's movements

Idiosyncratic risk
- Something happened to the company

If I give you 10 assets with data on their returns for the past 2 years, you can calculate the efficient frontier
- If I know the risk free rate, then yes, I can calculate this line!
- Can you calculate the expected return at any given risk level?
- Yes

W 10 Dis 3-17-17
- Ex. 1
- How do we translate this problem into a cash flow equation?
- Write this as a simple, net present value.

Options

0. Do nothing
0. Invest in current cash flow
0. Invest in the market

Q. How do you compare this to the market?
A. Do it via r here!

r is NOT necessarily the market rate.

- To compare one bond to another and such, you can use respective yields and if we want to compare non-defaulting bond, use American yield rather than Greek yield.
- It doesn't say what it is in this case, and to see if we do well on 8% return, compared to everything else, we apply it there.

- Ex. 2

Dividends in year 4

- What we get back
- Ignore years 3, 2, 1, 0
- Sort at Year 4 because we are buying 100 shares at Year 3
- Since dividends have been already paid, we just care about stock price at Year 3 and onward
- Dividends you get is NOT the same act year in this problem
- Equivalent cash flows can be rewritten as geometric series and it will be some term minus the growth

Exercise 3

- What type of this problem is this?
- Differential growth model
- Dividends model
- Perpetuity
- We have a growing perpetuity at this point in time

Exercise 4

- What is the dividend yield?
- yield question
- Asks for dividends yield is

Final Review Session 3-19-17

Present and Future Value

- Know the significance of a discount rate
- We have made some money but as we know from the bonds exercise, this doesn't have to be market rate!
- It could be a separate bond i.e. Greek bond vs American bond

Frequent Compounding

- Annuity formula
- Should be on the cheatsheet
- Sums up all the cash flows from Year 1 to T and provides you with a time period of 1 year before the cash flow shows up

Perpetuity

- PV = A/i

- The growing perpetuity only difference by -g and how will this thing get shown up with constant growth for the growing perpetuity version of it.

Payback Period

- How much time it takes to pay back a certain investment
- Does NOT take into account the time value of money

Discounted Payback Period

- The problem gets really hard if she asks you to solve for X

Exercise 2