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Technical Questions: Introduction

Technical Questions: Introduction

Technical questions are part of nearly every finance interview. While the level of difficulty of these questions varies from firm to firm, from interviewer to interviewer, and from candidate to candidate, every applicant will be grilled on technical questions in at least one round of interviews. This course offers a compilation of the most common technical questions from finance interviews in a variety of fields including investment banking, private equity, corporate finance, etc. Obviously, you will not encounter every question from this course. Likewise, your interview may include variations on the questions included here or even questions that are altogether new. If you have studied this course along with the WSO Behavioral Interview Course, however, you should be prepared to field any of your interviewer's questions with confidence.

Obviously, you should focus your attention on those, as well as on the sections relevant to your specific job interview. If you are preparing for a Sales and Trading interview, for example, you should focus on Stocks, Bonds/Loans/Interest Rates, Currencies, and Options & Derivatives. For Investment Banking positions, you should have a general background in all those categories, but you are most likely to encounter questions from the Accounting/Finance/Valuation and Mergers & Acquisitions sections. (You should always be prepared for the behavioral aspects of your interview, covered in the WSO Behavioral Interview Guide.)

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QUICK NOTE

The material in this guide is organized into the following topics:

- Current Events
- Accounting, Finance & Valuation
- Stocks
- Bonds, Loans & Interest Rates
- Currencies
- Options & Derivative,
- Mergers & Acquisitions

These concepts are further arranged according to basic, intermediate, and advanced levels of difficulty. The more common questions appear in ***boldface print***.

The final section of this Guide is Brainteasers. The purpose of a brainteaser during an interview is to see how you react under pressure. The purpose of this section of the guide is to give you some insight into what your thought process should look like. More important than actually solving the brainteaser is being able to organize your thoughts and deliver a reasonable response. The interviewer wants to observe your analytical aptitude, your capability to handle some stress, and your ability to think on your feet. Don't worry extensively about solving the answer correctly, but make sure you emphasize the key uncertainties in the analysis, as well as the major assumptions you would make in order to go about solving the problem.

You will soon realize that interviews are similar to a game. Your interviewer will likely push you to see how far you can go until you don't know an answer. That's a good thing. Even with a 4.0 in a finance and economics double major from Wharton, you still know little compared to the interviewer across the table. When studying these questions, keep in mind that you cannot prepare for everything your interviewers may ask. They will always be coming up with new questions and new twists on standard questions, so it is important that you understand the theory behind the answers, rather than just memorizing them.

Look for advice from "starred" users who have been certified as experienced finance professionals who consistently give sound advice.

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QUICK NOTE

The explanations in the Guide are intentionally brief; when there is a question that you do not understand, do some research and develop a deeper understanding. The message boards at Wall Street Oasis are a great place to get expert advice and insight from Wall Street insiders. Use the search function! With over a million posts to date, your question has probably been asked before, and an answer is in our archives.

Most answers to these questions should not take more than 30 to 60 seconds. Answer the question and move on. Do not try and guess your way through technical questions. If you do not know the answer, don't waste your interviewer's time. Just say you don't know. Do not apologize. Say something like "this is what I am thinking…" and ask for an explanation. There is no shame in not knowing what a dividend recap is if you're a history major with no finance experience. Just be confident in what you know and don't know. Your most important task is to prove that you can and want to learn on the job. If you get into questions from the advanced section of this course, remember that your interviewer is trying to see how you respond to pressure. Remain calm, cool, and collected.

Finally, although failure to answer a technical question usually won't disqualify you, missing the answer to a behavioral question can definitely hurt your chances. If you don't stumble much, your missteps on technical questions will usually be outweighed by truly connecting with your interviewer on a personal level and showing that you have the drive, passion, and ability to learn this crazy business! Even if you answer all of your technical questions perfectly, on the other hand, you will not get the job if your interviewers don't think you are someone they can enjoy "hanging out" with during those 80- to 120- hour weeks. The Wall Street Oasis Behavioral Interview Course has extensive advice on how to succeed in this crucial portion of the interview.

PLEASE NOTE THAT…

The first few bullets following each question present pertinent definitions and information about the concept. *Bullets in italics are sample responses.* Subsequent bullets may present common follow-up questions.

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[The Application/Interview Process]

The Application/Interview Process

The interview process in the US is relatively similar across most banks:

- Submit your resume - preferably submit your resume through a contact, or alumni if at all possible. If not you can submit a resume online, but that should be a last resort as it is much more difficult to have your resume chosen for an interview.
- Go through a first round of interviews. This will typically be in person on-campus if you are at a target school, or over the phone if you are at a non-target.
- If you make it through the first round of interviews, you will typically be brought in for a "superday." A superday is typically held at the office you are interviewing at and is a series of 6-12 ~30 minute interviews.
  - Larger firms tend to conduct more interviews than smaller firms so you can expect longer days.
  - If you are selected for a superday the firm will typically transport you into the city (fly, train, etc), put you up at a hotel, and take you to a superday dinner either the night before or the night after the interviews. Enjoy the superday dinner, if you are over 21 you can have a drink or two, but DON'T GET DRUNK. You want to prove you can be social, but not that you are the beer drinking king of TKE. Also, don't always focus the conversation on work. The Associate sitting next to you is probably working 100 hours a week and this is the first time

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eating a meal away from his desk in four days. The last thing he or she wants to talk about is how good you are at building a DCF model.

- During the superday process you will likely meet with people at various levels including typically at least one analyst, one associate, one VP and one MD.
- You will get all sorts of questions, both fit and technical. As a general rule, more senior bankers will be more focused on fit and your background, while junior bankers may like to grill you on the technicals, because it's their ass if you make a mistake while you are working under them. In nearly every interview though you will get the "walk me through your resume" or "tell me about yourself" so have that answer down 1000%.

- If all of those you interviewed with like you, you will get an offer. Around 1-2 out of every 10 superday interviewees will end up receiving an immediate offer, possibly the same day as the interviews. If you are middle of the pack, they may put you on hold and wait to see if their top choices accept or reject their offers. Most interviewees are "OK" and don't stand out in either a good way or a bad way, so find something that can help you stand out, and try and find a way to weave it into every one of your interviews.
- If you don't hear anything back after a week or two, you should follow up via email and continue to express your enthusiasm. Only switch to the phone if you don't receive a response to an email after a few attempts and try and communicate through your HR contact as much as possible. You can bring them news of other offers you have received, since that is basically your only leverage throughout the entire process. Never lie about other offers though, this will come back and bite you in the ass.

Outside of the US, the hiring process is slightly different:

When you submit your resume online, along with a cover letter you will also complete "competency questions" which are just written answers to the behavioral questions you will be asked in your interviews. The same concepts discussed in answering the questions in the Wall Street Oasis Behavioral Interview Course apply to answering these competency questions.

Instead of a Superday of interviews, you will be brought into an "assessment center" where you will

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be evaluated based on case studies, presentations, interviews, group exercises, etc.

Verbal, quantitative and reasoning written tests are also more common overseas than in the US.

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The Interview

Preparing for the Interview

Plain and simple, you need to start preparing for your finance interviews well in advance. However, even if your interviews are fast approaching, just a few hours of preparation can definitely help you make a more positive impact on the people sitting across the table from you.

Here are some quick tips of the things you should prioritize in your preparation:

PREPARE TO "TALK ABOUT YOURSELF": More details on this in the Wall Street Oasis Behavioral Interview Course, but you must have your 5-minute pitch about yourself down pat. It must be second nature and you can't be stumbling through your resume. You will get the "Walk me through your resume" (or a variation of it) in every interview you encounter, so make sure you know every single bullet on your resume inside and out. If you can't discuss something that is mentioned on your resume in detail, it shouldn't be included. This includes commenting on any specific analytical components prior internships or full-time experiences. You must be able to effectively communicate the situation and purpose of the analysis as well as the conclusion or key takeaways.

BANKING/FINANCE SPECIFIC QUESTIONS: The most common questions relating directly to finance include "why banking", "why this firm", "where do you see yourself in five years" and "pitch me a stock" (more common in Sales and Trading). If you have limited time, think about those questions.

THINK ABOUT THE BEHAVIORAL QUESTIONS: Again, more about the fit questions are included in the Behavioral Interview Course, but from a high level most of the questions you are asked will center around leadership, teamwork, your strengths and weaknesses, etc. Think of a couple stories

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you can tell your interviewer that prove you have these skills. You can then shape these stories to fit whatever question you are asked.

PRACTICE YOUR ANSWERS: Put yourself in front of a mirror, your roommate, your parents, your dog, whoever, and practice walking through your resume and telling a few stories. Even practicing just a couple of times will make you much more comfortable when you are in the hot seat.

WHAT TO WEAR/BRING THE DAY OF: Always business formal. It doesn't matter if you know the firm isn't business formal, unless your interviewer specifically tells you not to wear a suit and tie, you wear business formal attire. Preferably grey or navy suit/dress, with a modest tie as a male, and make sure your belt and shoes match. If you're going in for an internship interview, you probably shouldn't walk in wearing a $3,000 suit or a $300 tie, just make sure your suit fits you well, everything is ironed and wrinkle free, and your tie is properly tied. Bring a folder with a few copies of your resume, a few sheets of paper and a pen or pencil.

After the Interview

- The last piece of your interview will be the "Do you have any questions for me" question from your interviewer. You should have a few questions in mind that you can ask each interviewer. We have included some sample questions to ask later in the Behavioral Interview Course but some samples are questions relating to the interviewer's background and how they got started, the culture at the firm, what have they learned, etc. Do NOT ask how much money they make. Instant-ding.
- At the very end of the interview ask for a business card. If you have time between interviews, quickly jot something memorable about your conversation to mention in your thank you note (see below). This helps not only when emailing a thank you note, but it's always a good idea to keep track of all of your contacts; you never know when someone may come in handy, could be years down the road.
- Thank you notes are typically relatively meaningless, but given that they take so little time, it's always worth it to fire off a thank you note to each of your interviewers within 24 hours of your interview. Never send a group email, use a subject like "Thanks for the Interview," and try and mention something memorable about your conversation that may help them remember who you

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are. It should take you 5 minutes or less to write these, so if you can't think of anything memorable, don't worry about it. Thank them for taking the time, and tell them you look forward to hearing from them soon.

- If you are feeling ambitious, you may consider reaching out and asking for feedback on your performance. This should only be done after you have received a definitive answer, and if you got the offer, you shouldn't waste their time. You can either ask in an email or try calling if you are feeling real ambitious.

Keeping Current is Key!

In most interview processes, you will likely encounter questions about current events and market conditions, in addition to the more standard questions that follow.

Senior level interviewers (VPs, MDs, etc.) will often be more interested in your opinions about the markets as a whole than in your ability to walk them through a discounted cash flow model.

Answering their high level questions effectively will demonstrate your interest in current events and in the industry. This is crucial to showing your true drive and passion for the job. Perfecting the answers to standard technical questions may show your interviewer that you have done your homework, but your responses to current-event questions can prove to your interviewer you are able to think on your feet and express a coherent, intelligent opinion. Given that current events drive much of the transactional activity that investment banks compete for every day, you should be able to understand how specific current events or macroeconomic conditions impact the firm's ability to generate business. This also helps demonstrate your knowledge of the bigger picture and strategy behind the industry to your interviewer.

QUICK NOTE

Answering these types of questions without some sort of background on the topic is nearly impossible. Your interviewers will have a thorough understanding of the topics they are asking you about, and they will be able to tell immediately if you try to answer off the cuff or "wing it".

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The only way to succeed is to know what is going on. Your interviewer probably won't grill you on some obscure article from the 18th page of the Financial Times from three weeks ago, but, you may be asked about yesterday's lead story in the Wall Street Journal, especially if the story is related to the firm that is interviewing you. Be sure you pay close attention to any recent news of the company to which you are applying.

Unfortunately, you cannot cram for this portion of the interview in the way you can for the technical topics. Constant monitoring of the markets, the news, and the economy is essential. To ensure that you are prepared, read the at least the headlines of publications like the Wall Street Journal, Financial Times and The Economist every day. Although these are paid publications, the insights you can gain from reading them are invaluable to your interview preparation. You should give yourself about 30-60 minutes every day reading them if you really want to absorb the latest financial news. Some big stories to keep an eye out for are political elections and their impact on the economy, financial scandals, M&A and IPOs, foreign economies and markets (China, the Middle East, European Union, Greece, Mexico), interest rates, employment levels, inflation, Fed decisions, etc.

In addition to reading the headlines, you should pick out an interesting article from a non-headline story each day. Referring to a lesser-known fact or story within a discussion of broader market issues can be a strong point of differentiation between you and other candidates. Holding an intelligent conversation about the latest current events is a relatively easy way to impress your interviewer with your passion for the industry.

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[Financial Reporting Basics]

Financial Reporting Basics

Throughout this guide, we refer to 10-Ks and 10-Qs...but what are they? Financial reports filed with the Securities and Exchange Commission (SEC) are required of any company with publicly traded securities (stocks, bonds, etc.) in the United States. These documents must follow very specific regulatory standards and are available for anyone to see at any time. Such documentation is required essentially any time a public company experiences a significant financial event, and the most relevant documents are 10-Ks (annual reports) and 10-Qs (quarterly reports).

10-K: The 10-K includes a written synopsis of the company's strategy and results for a given fiscal year. It includes a letter to shareholders, management information and compensation, management discussions and analysis, and an auditor's statement. It also includes detailed financial statements for the fiscal year, including a Balance Sheet, Income Statement, and Cash Flow Statement.11 The 10-K also includes a "Notes" section that explains to the public any adjustments made to financial statements in previous reports. The Notes section of the 10-K is where many investment banking analysts spend their time, as it contains detailed information regarding a company's operations and financial position, for example, financial performance by operating segment/division, or specific terms of corporate debt and equity securities. There is also a Financial Highlights section, a simplified and unregulated summary of the firm's financial performance.

10-Q: The 10-Q is a boiled-down 10-K. It must be filed by a public company for each fiscal quarter. The 10-Q focuses mainly on financial statements for the most recent quarter (and the year-to-date period) and includes less narrative information.

8-K: An 8-K is a special report issued by a company to notify shareholders and/or the SEC of material, unscheduled corporate events. For example, a company would file an 8-K to inform

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shareholders and the SEC of definitive purchase or sale agreements, capital markets activity (or transactions) that the company expects to undertake, such as a debt or equity capital raise.

PROXY STATEMENT: A proxy statement is a document that a company is required to file with the SEC when soliciting shareholder votes. A proxy includes information on voting procedures, background information about nominees to the company's board of directors, the company's board of directors' and executive compensation, and an itemization of all fees paid to the auditor.

These reports can be found at several locations online, including www.sec.gov (http://www.sec.gov) , a firm's own website, Google Finance, or a database like CapitalIQ.

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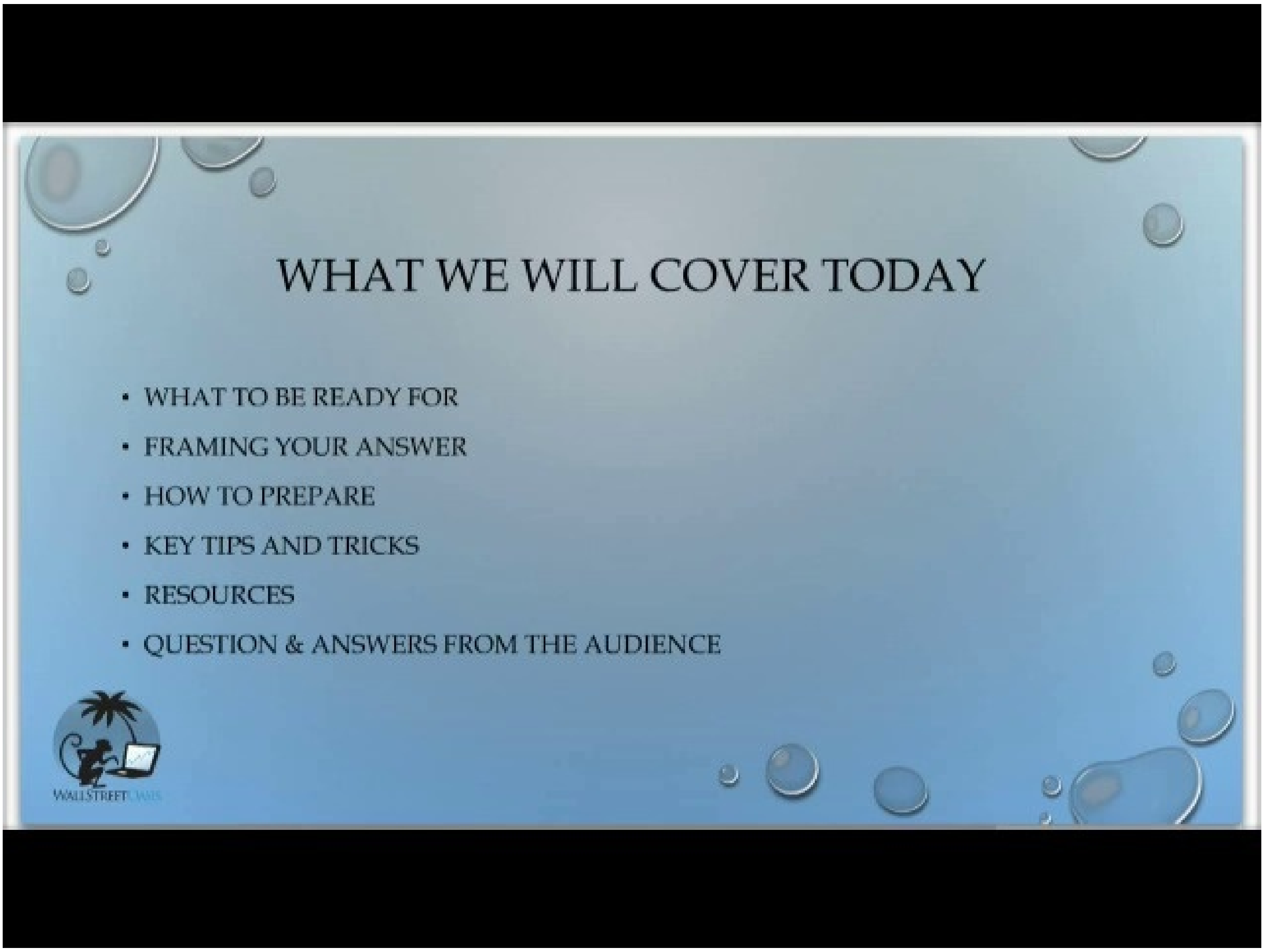
Investment Banking Best Practices: Technical Interview



Watch video at https://www.wallstreetoasis.com/courses/technical-interview-course/module-1-introduction-and-overview/investment-banking-best

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Canadian Middle Market M&A Investment Banking Overview

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Basic Concepts, Questions, and Case Studies

Basic Concepts, Questions, and Case Studies

WHAT ARE THE THREE MAIN FINANCIAL STATEMENTS?

- Income Statement – shows the company's revenues and expenses during a particular accounting period
  - Revenues – Cost of Goods Sold – Expenses = Net Income
  - Expenses include both cash and non-cash expenses, as well as both operating and non-operating expenses
  - Net Income DOES NOT equal cash flow and should not be considered an accurate representation of a company's ability to generate cash because the Income Statement includes non-cash expenses and does not reflect the cash impact of changes in Working Capital or Capital Expenditures

- Balance Sheet – company's statement of financial position on one given day, typically the final date of a particular accounting period
  - Assets = Liabilities + Shareholder's Equity

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- Assets and Liabilities are often shown in order of "liquidity", or the rate at which that asset or liability is expected to be realized in cash (ordered from most current/liquid to least current/liquid)

- Statement of Cash Flows – shows how a company's Net Income is adjusted upwards or downwards for non-cash and non-operating expenses to calculate a company's Cash Flow from Operations.
  - SCF also shows capital expenditures (a non-operating cash outflow) as well as cash inflows from the sale of capital assets (for example, Plant, Property & Equipment) in the Cash Flow from Investing section
  - SCF also contains the Cash Flow from Financing section, which shows the cash impact (inflow or outflow) of activity with a company's investors (both debt and equity). This includes debt capital raised or repaid, equity capital raised or repurchased, or dividends paid
  - Beginning Cash + CF from Operations + CF from Investing + CF from Financing = Ending Cash

SAMPLE ANSWER: *The three main financial statements are the Income Statement, the Balance Sheet, and the Statement of Cash Flows. The Income Statement shows a company's revenues, costs, and expenses, which together yield net income. The Balance Sheet shows a company's assets, liabilities, and equity and is a representation of the company's financial health/position on one particular day in time. The Cash Flow Statement starts with net income from the Income Statement; then it shows adjustments for noncash expenses, non-expense purchases such as capital expenditures, changes in working capital, or debt repayment and issuance to calculate the company's ending cash balance.*

HOW ARE THE THREE MAIN FINANCIAL STATEMENTS CONNECTED?

- This question is very common, but it is usually just a check-the-box question. If you can nail a few

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solid connections, you should be OK. Some of the main connections are:

- Net Income flows from the IS into cash flow from operations on the CF Statement.
- Net income minus dividends is added to retained earnings from the prior period's Balance Sheet to come up with retained earnings on the current period's Balance Sheet.
- Beginning Cash on the CF Statement is cash from the prior period's Balance Sheet, and Ending Cash on the CF statement is Cash on the current period's Balance Sheet.

- Simplified Overview of the Three Statements and Connections
    - Income Statement
        - Net income is the beginning point for the Cash Flow statement.
        - Interest expense on the Income Statement is calculated from the debt on the Balance Sheet.
        - Net income minus dividends paid = addition to retained earnings on the Balance Sheet.
        - Depreciation Expense is calculated based on property, plant, and equipment (PP&E) from the Balance Sheet. A $10 increase in depreciation expense will result in a $10 reduction in net PP&E and a $10 x (1-T) in net income. Depreciation is a non-cash expense, and as a result, the Cash Flow from Operations section of the Cash Flow Statement would be adjusted upward to accurately reflect the cash position of the company.
        - Similarly, Amortization Expense is calculated based on Amortizable Intangible Assets from the Balance Sheet. Amortization is a non-cash expense, and as a result, the Cash Flow from Operations section of the Cash Flow Statement would be adjusted upward to accurately reflect the cash position of the company.

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Cash Flow Statement

- Organized into Cash Flow from Operations, Investing, and Financing.
- Net income is the one of the first lines and comes from the Income Statement.
- Adjust for non-cash items (like Depreciation and Amortization) from the Income Statement.
- Adjust for change in working capital, which is calculated from changes in current assets and current liabilities on the Balance Sheet. (More information on changes in working capital is presented later in this Guide.)
- Cash Flow from Investing is often primarily comprised of purchases and sales of PP&E, or other capital assets, including acquisitions. Capital Expenditures increase the PP&E account on the Balance Sheet.
- One of the final lines will be change in cash.
- Beginning cash (which comes from prior period's Balance Sheet) plus change in cash yields ending cash balance on the current period's Balance Sheet.

- Balance Sheet
    - Debt is affected by Cash Flow from financing, which would include any mandatory amortization of debt, optional amortization, repayments, new debt issuance, etc.
    - Cash balance is determined from the Cash Flow statement as described above.
    - Assets like PP&E and intangibles are reduced in value by depreciation and amortization as described above.

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- Retained earnings is increased/decreased by net income minus dividends paid as described above.

A good summary answer could be like the one shown below. Or start with a few connections from the list above, and be ready to expand your answer as necessary.

SAMPLE ANSWER: *The three main financial statements show separate views, and together they create a whole picture of a company's financial health. For example, the Income Statement closes with a net income figure that appears on the Cash Flow Statement as an addition to cash flow from operations. The Cash Flow Statement's beginning cash balance comes from the Balance Sheet for the prior period. The Cash Flow Statement's ending cash balance becomes the cash asset on the current period's Balance Sheet.*

WALK ME THROUGH THE MAJOR LINE ITEMS OF AN INCOME STATEMENT (NEGATIVE NUMBERS ARE SHOWN IN PARENTHESES).

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	YEAR 1 ($)	YEAR 2($)
Revenue	1,000	1,200
Cost of Goods Sold	100	120
GROSS PROFIT	**900**	**1,080**
Operating Expenses	150	170
Depreciation	20	22
Amortization	30	33
OPERATING INCOME	**700**	**855**
Net Interest Expenses	90	90
Other Expenses	10	10
PRE-TAX INCOME	**600**	**755**
Income Tax Provision	25	40
NET INCOME	**575**	**735**

SAMPLE ANSWER: *The first line of the Income Statement represents revenues or sales. From that you subtract the cost of goods sold, which leaves gross profit. Subtracting operating expenses, depreciation and amortization from gross profit gives you operating income. From operating income, you subtract interest expense and any other expenses (or add other income) to get pre-tax income. Then subtract tax payments and what's left is net income.*

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WHEN SHOULD AN EXPENSE APPEAR ON THE INCOME STATEMENT?

- Expenses that end up on the income statement are things like marketing expense, employee salaries, etc.
- In order to be on the income statement, the expense must be tax deductible and must have been incurred during the period of the income statement.

WHAT IS XXX ON THE BALANCE SHEET?

Here are just some basic definitions of the line items on the balance sheet:

- Assets
  - Cash: Self-explanatory, just like cash you have sitting in the bank.
  - Short-Term Investments: Almost as liquid as cash, but not exactly. This includes things like money market accounts, CDs, etc.
  - Inventory: Items that have already been produced, but haven't yet been sold. Clothing that is on the shelves, video games that are on the racks.
  - Accounts Receivable: The company has sold items but hasn't yet been paid for them. It's been recorded on the income statement but is like an IOU from the customer.
  - Prepaid Expense: The company has paid for expenses in cash, but hasn't yet recognized them as cash on the Income Statement.
  - Property, Plant and Equipment (PP&E): Any factories, warehouses, offices, land that has long term (greater than one year) value and contributes to the Company's core business.
  - Intangible Assets: This includes things like trademarks, patents and other intellectual property. This is similar to goodwill and normally is the result of M&A activity. Certain intangible assets are amortizable.

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- Goodwill: When a company acquires another company and pays a premium over the book value of the shareholders' equity, goodwill is created. Goodwill is no longer amortizable under U.S. GAAP. Instead, Goodwill is tested annually for impairment.

- Long-Term Investments: These are investments that are longer term and less liquid than short term investments but aren't PP&E.

- Liabilities
  - Revolver: This is a line of credit, which is not fixed in size, but rather has a maximum. A company can borrow and then pay off the debt at any time. Think of it as a credit card for companies. A Revolver is typically secured by a company's working capital assets, such as Accounts Receivable, Inventory, and Prepaid Assets.

  - Accounts Payable: This is almost the opposite of Accounts Receivable. The company has received items, but hasn't yet paid for them. It's an IOU to their supplier.

  - Deferred Revenue: The company has collected cash from customers for services that will be delivered over time (think a subscription you pay up front for an entire year). Accrued Expenses: These expenses are recorded on the income statement but hasn't yet paid them in cash. These are typically recurring expenses like rent, salaries, etc.

  - Deferred Tax Liability: The company has paid less cash taxes than it actually owes and will have to make it up by paying additional taxes to the government in the future.

  - Long-Term Debt: Just like a car loan or a mortgage on your house, this is an amount of debt that matures in more than a year.

- Equity
  - Common Stock and Additional Paid in Capital: This is the market value of the shares of stock

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when they were issued by the company, not the market value at the current time.

- Treasury Stock: This is the total value of shares that the company has repurchased from investors, at the value for which they were repurchased, not their current value.
- Retained Earnings: This is the company's cumulative net income minus any dividends that have been paid to equity investors.

WHAT ARE THE THREE COMPONENTS OF THE STATEMENT OF CASH FLOWS?

- The Statement of Cash Flows is one of the three financial reports that all public companies are required by the SEC to produce on a quarterly basis. (Most non-public companies also produce Cash Flow (CF) Statements.) The CF Statement comprises the three main components described below, showing all the company's sources and uses of cash. Since companies tend to use accrual accounting, a company's net income may not (and most of the time does not) portray how much cash is actually flowing in or out due to non-cash expenses, investing activities, financing activities, changes in working capital, etc. Because of this, even profitable companies may have trouble managing their cash flows, and non-profitable companies may be able to survive without raising outside capital.
- **CASH FROM OPERATIONS:** Cash generated or lost through normal operations, sales, and changes in working capital (more detail on working capital below).
- **CASH FROM INVESTING:** Cash generated or spent on investing activities; may include, for example, capital expenditures (use of cash) or asset sales (source of cash). This section will also show any investments in the financial markets and operating subsidiaries. NOTE: This section can explain a large negative cash flow during the reporting period, which isn't necessarily a bad thing if it is due a large capital expenditure in preparation for future growth.
- **CASH FROM FINANCING:** Cash generated or spent on financing the business; may include proceeds from debt or equity issuance (source of cash) or cost of debt or equity repurchase (use of cash).

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The three components of the Cash Flows Statement are Cash from Operations, Cash from Investing, and Cash from Financing.

IF YOU COULD USE ONLY ONE FINANCIAL STATEMENT TO EVALUATE THE FINANCIAL STATE OF A COMPANY, WHICH WOULD YOU CHOOSE?

SAMPLE ANSWER: *I would want to see the Cash Flow Statement so I could see the actual liquidity position of the business and how much cash it is using and generating. The Income Statement can be misleading due to any number of non-cash expenses that may not truly be affecting the overall business. And the Balance Sheet alone just shows a snapshot of the Company at one point in time, without showing how operations are actually performing. But whether a company has a healthy cash balance and generates significant cash flow indicates whether it is probably financially stable, and this is what the CF Statement would show.*

SAMPLE FOLLOW UP QUESTION: Now assume you can choose to see two of a company's three financial statements. Which would you choose?

SAMPLE FOLLOW UP ANSWER: *I would want to see the Income Statement and the Balance Sheet because one can produce an accurate expected or illustrative Cash Flow Statement with the information presented in the Income Statement and Balance Sheet. The Cash Flow Statement begins with Net Income and then adjusts for non- cash and non-operating expenses, both sourced from the Income Statement. From there, we can calculate the changes in net working capital from information on the Balance Sheet to calculate Cash Flow from Operations. Capital Expenditures in the Cash Flow from Investing section of the Cash Flow Statement could be inferred by taking the year over year change in PP&E from the Balance Sheet, plus Depreciation Expense, less any cash inflows from the sale of capital assets. Repayments of Debt on the Cash Flow from Financing section of the Cash Flow Statement can be inferred using the year over year changes in short-term and long-term debt balances, while also adjusting for any debt capital raised. Similarly, repurchases of Equity, dividends paid to equity investors and equity capital raised would be reflected on the Balance Sheet as well.*

WHAT IS THE DIFFERENCE BETWEEN THE INCOME STATEMENT AND STATEMENT OF CASH FLOWS?

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SAMPLE ANSWER: *A company's sales and expenses (both cash and non-cash) are recorded on its Income Statement. The Statement of Cash Flows records what cash is actually being generated and used during the reporting period and where it is being spent. Other items included on the Cash Flow Statement could be issuance or repurchase of debt or equity and capital expenditures or other investments. Amortization and depreciation will be reflected as expenses on the Income Statement, but they will be added back to Net Income on the Cash Flow Statement since they are expenses but not actually a use of cash.*

WHAT IS THE LINK BETWEEN THE BALANCE SHEET AND THE INCOME STATEMENT?

- The profits generated on the Income Statement after any payment of dividends are added to shareholder's equity on the Balance Sheet under retained earnings.
- Debt on the Balance Sheet is used to calculate interest expense on the Income Statement.
- Property, plant and equipment on the Balance Sheet is used to calculate depreciation expense on the Income Statement.
- There are many other links, but the above are some of the main connections.

SAMPLE ANSWER: *There are many links between the Balance Sheet and the Income Statement. The major link is that any net income from the Income Statement, after the payment of any dividends, is added to retained earnings. In addition, debt on the Balance Sheet is used to calculate the interest expense on the Income Statement, and property plant and equipment will be used to calculate any depreciation expense.*

WHAT IS THE LINK BETWEEN THE BALANCE SHEET AND THE STATEMENT OF CASH FLOWS?

- Beginning cash on CF comes from the prior reporting period's Balance Sheet.
- Cash from operations is calculated using changes in Balance Sheet accounts—net working capital (current assets minus current liabilities) and other changes in assets and liabilities that cannot be classified as investing or financing activities.
- Cash Flow's depreciation adjustment is calculated on the Balance Sheet's net property, plant, and equipment (PP&E).

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- Investments in PP&E come from the Balance Sheet and are accounted for under investment activities on the Cash Flow Statement.
- Ending cash on the CF Statement goes back onto the Balance Sheet.

SAMPLE ANSWER: *Beginning cash on the Statement of Cash Flows comes from the previous period's Balance Sheet. Cash from operations on the Cash Flow Statement is affected by the Balance Sheet's numbers for change in net working capital, current assets minus current liabilities. Property, plant, and equipment is another Balance Sheet item that affects the Cash Flow Statement because depreciation is based on the amount of PP&E a company has. Any change due to purchase or sale of property, plant, and equipment will affect cash from investing. Finally, the Cash Flow Statement's ending cash balance becomes the beginning cash balance on the new Balance Sheet.*

SAMPLE FOLLOW UP QUESTION: How can you determine activity with investors from these two statements?

SAMPLE FOLLOW UP ANSWER: *Debt or equity raised reflected on the Balance Sheet during a given accounting period will be included as a cash inflow in the Cash Flow from Financing section of the Cash Flow Statement during the same accounting period. Similarly, debt or equity capital repaid/repurchased during the accounting period will be reflected as a cash outflow in the same section, as will dividends paid to shareholders.*

SAY I HAVE AN UNKNOWN ITEM THAT BELONGS ON THE BALANCE SHEET. HOW WOULD I BE ABLE TO TELL IF IT SHOULD BE AN ASSET OR A LIABILITY?

- Think of it this way. Will the line item result in the company receiving cash in the future, or will it result in the company needing to spend cash in the future? If it will result in an increase in cash in the future, then it is an asset. If it will result in a decrease in cash in the future, then it is a liability.

WHAT IS GOODWILL?

- Goodwill is an asset that captures what is paid for an acquisition over fair market value.
- Here is an example: Company A buys Company B for $100 million in cash. Company B has one asset, which is a factory with a book value of $75 million, debt of $25 million, and equity of $50

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million which equals the book value (assets minus liabilities).

- Company A's cash balance declines of $100 million to finance acquisition (cost of the acquisition)
- Company A's PP&E increases by $75 million (book value of Company B's factory)
- Company A's debt increases by $25 million (Company B's acquired debt)
- Company A's goodwill increases $50 million (purchase price of Company B minus book value of equity in Company B)

WHAT IS THE PURPOSE OF THE CHANGES IN WORKING CAPITAL SECTION OF THE CASH FLOW STATEMENT?

- Due to accrual accounting, changes in balance sheet items like accounts payable and accounts receivable are not reflected.

SAMPLE FOLLOW UP QUESTION: What does it mean if your change in net working capital is negative on the statement of cash flow? Is negative working capital a bad thing for a company?

SAMPLE FOLLOW UP ANSWER: *While negative working capital by pure definition (i.e. current liabilities > current assets) may be indicative of a solvency issue for a company, or an inability to satisfy its obligations, negative working capital is not necessarily a bad thing. If a company is making a concerted effort to stretch out its payment terms with its vendors as much as possible in order to preserve its cash position (which is not included in the calculation of working capital), this would result in negative working capital (since Accounts Payable would likely cause an excess of current liabilities over current assets). The company still has the liquidity to satisfy its obligations, but stretching out the vendor payment provides the company with the most amount of flexibility.*

WHAT IS THE DIFFERENCE BETWEEN ACCOUNTS PAYABLE AND ACCRUED EXPENSES?

- Basically they are the same thing. The main difference is usually that accounts payable is typically a one-time expense with an invoice (such as the purchase of inventory) while accrued expenses are recurring (like employee expenses). Both accounts are reflected in working capital

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calculations.

WHAT IS DEFERRED REVENUE AND WHY IS IT A LIABILITY?

- Deferred revenue is cash that has been collected in advance for something that hasn't yet been delivered. For example, if you pay for a monthly gym class membership a year in advance, you haven't yet received a year's worth of exercise classes; therefore the company has not yet recognized the revenue since the service hasn't been delivered. At the beginning of the year they will show the full amount of the subscription in deferred revenue, and that amount will decrease by 1/12 of the amount each month as issues are delivered.
- All of the cash is received up front, so the liability goes up by the amount of cash received, therefore reflecting the influx on the cash flow statement. Since no additional cash is received each month, the reduction in the liability offsets the equivalent amount of revenue recognized so it has no effect on the company's cash flows.

SAMPLE FOLLOW UP QUESTION: Why has deferred revenue come under greater focus from the IRS, SEC and investor community?

SAMPLE FOLLOW UP ANSWER: *Many of the high profile, publicly traded technology companies that are highly valued by investors operate with a monthly or annual license/subscription model. Investors like these businesses due to their ability to retain customers and generate repeat, recurring and contractual revenue. Therefore, it is important that investors understand the cash flow/liquidity implications of a company that has already collected cash for a product or service it has yet to deliver. The delivery of this good/service consumes resources from the business, thus reducing available working capital to grow the company.*

WHAT IS THE DIFFERENCE BETWEEN ACCOUNTS RECEIVABLE AND DEFERRED REVENUE?

- Accounts receivable is revenue, which has been earned and recognized because the product has been delivered, but the customer has not yet paid the cash. Deferred revenue is cash that has been collected for products which have not yet been delivered, so the revenue has not yet been recognized. Accounts receivable is an asset on the Balance Sheet, whereas deferred revenue is a liability.

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WHAT IS THE DIFFERENCE BETWEEN ACCOUNTS PAYABLE AND PREPAID EXPENSES?

- Prepaid expenses are payments that have been made for products or services that will be delivered in the future. As the products or services are received they will be recognized as expenses on the income statement. Accounts payable is a liability for a good or service that has been received and recognized as an expense, but has not yet been paid for in cash.

IF DEPRECIATION IS A NON-CASH EXPENSE, THEN HOW DOES IT AFFECT THE CASH BALANCE?

- Even though depreciation is a non-cash expense, it is still tax deductible. This means that it reduces your pre-tax income, and therefore reduces the amount of taxes a company must pay, which increases the company's cash balance.

WHAT IS A DEFERRED TAX LIABILITY AND WHY MIGHT ONE BE CREATED?

- Deferred tax liability is a tax expense amount reported on a company's income statement not actually paid in cash during that accounting period, but expected to be paid in the future. This occurs when a company pays less in taxes to the government than they show as an expense on their income statement.
- This can be caused due to differences in depreciation expense between book reporting (GAAP) and tax reporting. This will lead to differences in tax expense reported in the financial statements and taxes payable to the government.

SAMPLE FOLLOW UP QUESTION: What is a deferred tax asset and why might one be created?

SAMPLE FOLLOW UP ANSWER: *A deferred tax asset occurs when a company pays more in taxes to the government than they show as an expense on their income statement in a reporting period.*

SAMPLE FOLLOW UP ANSWER: *Another reason a company may generate a deferred tax asset is through a Net Operating Loss (NOL). If a company incurs more expenses than the revenue it generates, and therefore incurs a loss from operations, that company may apply the loss generated in the period to a period(s) of future operational profitability in order to reduce future tax expenses.*

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WHAT IS EBITDA?

- EBITDA stands for **E**arnings **B**efore **I**nterest, **T**axes, **D**epreciation, and **A**mortization. It is a good metric for evaluating a company's profitability. It is sometimes used as a proxy for free cash flow because it will allow you to determine how much cash is available from operations to pay interest, capital expenditures, etc.
- EBITDA is one of the most important single items someone will look at in evaluating a Company.
- EBITDA = Revenues – Expenses (excluding interest, taxes, depreciation, and amortization)
- A very common valuation methodology is the EV/EBITDA multiple, which estimates the Enterprise Value of a company using a multiple of its EBITDA.7 An EV/EBITDA multiple is probably the most commonly used "quick and dirty" valuation multiple used by investment banks, private equity firms, hedge funds, etc.
- Another use of EBITDA is the calculation of a company's leverage ratio (Total Debt/EBITDA) and interest coverage ratios (EBITDA/Interest). These ratios are used for comparing companies based on their amount of debt compared with the amount of cash they are generating that can service the interest on their debt.

SAMPLE ANSWER: *EBITDA is an acronym for Earnings Before Interest, Taxes, Depreciation, and Amortization. It's a good high-level indicator of a company's financial performance. Since it removes the effects of financing and accounting decisions such as interest and depreciation, it's a good way to compare the performance of different companies. It serves as a rough estimate of free cash flow, and is used in the EV/EBITDA multiple to quickly establish a company's high-level valuation.*

HOW COULD A COMPANY HAVE POSITIVE EBITDA AND STILL GO BANKRUPT?

SAMPLE ANSWER: *Bankruptcy occurs when a company can't make its interest or debt payments. Since EBITDA is Earnings BEFORE Interest, if a required interest payment exceeds a company's EBITDA, then if they have insufficient cash on hand, they would soon default on their debt and could eventually need bankruptcy protection.*

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WHAT IS ENTERPRISE VALUE?

- Enterprise Value is the value of an entire firm, both debt and equity, according to the equation below. This is the price that would be paid for a company in the event of an acquisition.
- Enterprise Value = Market Value of Equity + Debt + Preferred Stock + Minority Interest – Cash

SAMPLE ANSWER: *Enterprise Value is the value of a firm as a whole, to both debt and equity holders. To calculate Enterprise Value in its simplest form, you take the market value of equity (aka the company's market cap), add the debt and the value of outstanding preferred stock, add the value of any minority interests the company owns, and then subtract the cash the company currently holds.*

NOTE: This is a highly simplified Enterprise Value formula. When bankers working on a deal are calculating the true Enterprise Value in an acquisition, they must take into account numerous other factors such as leases, pension obligations, and NOLs.

WHAT IS NET DEBT?

SAMPLE ANSWER: *Net debt is a company's total debt minus the cash it has on the balance sheet. Net debt assumes that a company pays off any debt it can with excess cash on the balance sheet. One can simplify the Enterprise Value formula above by replacing "Debt" with "Net Debt" and removing the subtraction of Cash, since that is already built into Net Debt.*

IF ENTERPRISE VALUE IS $150MM, AND EQUITY VALUE IS $100MM, WHAT IS NET DEBT?

SAMPLE ANSWER: *Since Enterprise Value = Equity Value + Net Debt + Preferred Stock + Minority Interest, if we assume there is no minority interest or preferred stock, then Net Debt will be $150mm –$100mm, or $50mm.*

WHY DO YOU SUBTRACT CASH FROM ENTERPRISE VALUE?

SAMPLE ANSWER: *One good reason is that cash has already been accounted for within the market value of equity. You also subtract cash because it can be used either to pay a dividend or to reduce debt, effectively reducing the purchase price of the company.*

WHAT IS THE DIFFERENCE BETWEEN ENTERPRISE VALUE AND EQUITY VALUE?

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EQUITY VALUE	**ENTERPRISE VALUE**
Net Debt	
Preferred Stock	
Minority Interest	

SAMPLE ANSWER: *Equity Value represents residual value for common shareholders after the company satisfies its outstanding obligations (net debt, preferred stock, which is senior to common equity).*

WHEN LOOKING AT THE ACQUISITION OF A COMPANY, DO YOU LOOK AT EQUITY VALUE OR ENTERPRISE VALUE?

SAMPLE ANSWER: *Because the acquiring company must purchase both liabilities and equity in order to take over the business, the buyer will need to assess the company's Enterprise Value, which includes both the debt and the equity.*

WHEN CALCULATING ENTERPRISE VALUE, DO YOU USE THE BOOK VALUE OR THE MARKET VALUE OF EQUITY?

- Technically, you should use the market value of both debt and equity, so as to estimate the true value based on supply and demand.
- In practice however, you normally use the market value of only the equity because, if a company is publicly traded, this is a very easy value to come up with simply by looking up a company's market cap.

SAMPLE ANSWER: *When calculating a company's Enterprise Value, you use the market value of the equity because that represents the true supply-demand value of the company's equity in the open market.*

COULD A COMPANY HAVE A NEGATIVE BOOK EQUITY VALUE?

SAMPLE ANSWER: *Yes, a company could have a negative book Equity Value if the owners are taking out large cash dividends or if the company has been operating for a long time at a net loss, both of which reduce*

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shareholders' equity.

WHAT IS THE DIFFERENCE BETWEEN PUBLIC EQUITY VALUE AND BOOK VALUE OF EQUITY?

SAMPLE ANSWER: *Public Equity Value is the market value of a company's equity; while the book value is just an accounting number. A company can have a negative book value of equity if it has been taking large cash dividends, or running at a net loss; but it can never have a negative public Equity Value, because it cannot have negative shares or a negative stock price.*

WHAT BASIC TOOLS AND METRICS DOES A FINANCIAL PROFESSIONAL USE TO EVALUATE POTENTIAL PROJECTS OR INVESTMENTS? (SEE ACCOMPANYING BASIC FINANCE CASE STUDY)

SAMPLE ANSWER: *Cost of Capital: An individual's cost of capital, or "discount rate" represents what he or she could earn by investing in another asset (the opportunity cost). In general, if an investment is expected to generate a return in excess of an investor's cost of capital, that investor should pursue the project. In general, equities tend to have a higher discount rate because the expected potential returns are higher, and carry more risk than fixed income (higher risk and higher reward). Bonds/debt typically have a lower discount rate because the investor's compensation is primarily limited to the interest earned on the debt instrument, rather than appreciation in price of the asset. Furthermore, the risk on the investment is also generally lower since it is more senior than equity in the waterfall in the event of a default. Interest paid on debt reduces taxable income, so there is a tax deductibility benefit from having some debt.*

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Sample Costs of Capital:

Investment Type:	Opportunity Cost (Discount Rate):
Checking Account:	0.1%
High-Yield Savings Account:	2.0%
Govt. Bonds, Corporate Debt, etc.:	5.0%
Public Equities:	10.0%

Personal WACC Calculation:	Discount Rate:	Allocation:
Checking Account:	0.1%	35.0%
High-Yield Savings Account:	1.0%	30.0%
Bonds / Loans to Friends, Corporate Debt, etc.:	5.0%	20.0%
Public Equities:	10.0%	15.0%
Your Personal "WACC":	2.8%	

Source of Funding:	After-Tax Discount Rate:	Allocation:
Equity:	10.0%	65.0%
Debt:	5.0%	35.0%
Company WACC:	8.3%	

SAMPLE FOLLOW UP QUESTION: How does the process work for companies?

SAMPLE FOLLOW UP ANSWER: *The decision process is similar for companies when evaluating investments and projects, but the decision is more dependent on the company's sources of funding (its investor composition). At the firm level, the WACC represents the average discount rate that a company pays its existing investors (both debt and equity), proportionally weighted by the company's capital structure (i.e. how much total funding is comprised of debt vs. equity?). A company WACC will depend on the company's size, stability, the interest rate it pays on its debt, its tax rate, and how volatile its stock is relative to the rest of the market.*

SAMPLE FOLLOW UP ANSWER: *Internal Rate of Return (IRR): The IRR of a particular investment or asset is another type of Discount Rate, similar to WACC. It represents the effective compounded interest rate (or rate of return) on an investment. Solving for an IRR provides another way to evaluate investments or projects: does this investment opportunity present the best risk/reward? The IRR of a potential investment is not known in advance; it is an output of a particular investment analysis.*

SAMPLE FOLLOW UP QUESTION: When evaluating whether or not to invest $200K in real estate, consider the following assumptions - do you think we should invest in this real estate?

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"Asking Price" (Initial Investment):	$200
Annual Cash Flow from Renting Apartment:	$12
Apartment Sale Value (Assuming Sale in Year 5):	$200
Our Opportunity Cost (Discount Rate):	2.8%

Cash Flows:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Rental Income:		$ 12	$ 12	$ 12	$ 12	$ 12
Property (Purchase) / Sale:	(200)	-	-	-	-	200
Net Cash Flows:	$ (200)	$ 12	$ 12	$ 12	$ 12	$ 212

Internal Rate of Return (IRR):	6.0%
Should We Invest?	Yes

CONCLUSION: *We should make this investment of $200K today since this asset has a projected IRR of 6%, relative to our "internal" cost of capital of 2.8%. If we invested $200K and earned 6% on it each year, compounded annually, we'd get the equivalent of the cash flows shown in the analysis.*

- The IRR is the Discount Rate at which the NPV equals $0. NPV is like Present Value, but it is "net" of the cost of the initial investment.
- Excel's NPV function does not do this, you must manually do it in a separate row!

SAMPLE ANSWER: *Present Value: When evaluating a potential investment, a company or individual can calculate the present value of that investment by discounting the asset's projected future cash flows to today's time value, using a discount rate (the cost of capital).*

SAMPLE FOLLOW UP QUESTION: When evaluating whether or not to invest $200K in real estate, consider the following assumptions - do you think we should invest in this real estate?

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"Asking Price" (Initial Investment):	$200
Annual Cash Flow from Renting Apartment:	$12
Apartment Sale Value (Assuming Sale in Year 5):	$200
Our Opportunity Cost (Discount Rate):	2.8%

Cash Flows:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Rental Income:		$ 12	$ 12	$ 12	$ 12	$ 12
Property Sale:		-	-	-	-	200
Net Cash Flows:		**$ 12**	**$ 12**	**$ 12**	**$ 12**	**$ 212**
Present Value (PV):	**$ 229**					
Should We Invest?	**Yes**					

We should make this investment of $200K today since this asset has a present value of $229K based on our assumptions for future rental income, property values and an internal discount rate of 2.8%. The key uncertainties in the analysis include (i) Apartment Sale Value - subject to macroeconomic conditions; (ii) Annual Cash Flow from Rent - could decline if apartment is vacant for longer than expected; (iii) Asking Price - if seller increases asking price, investment is less compelling ; (iv) Opportunity Cost - if we become aware of a favorable alternative investment, this investment is less compelling.

WHAT IS VALUATION AND WHAT IS IT USED FOR?

- Valuation is the procedure of calculating the worth of an asset, security, company, etc.
- This is one of the primary tasks that investment bankers do for their clients. Investment bankers are hired to value a company, often in the context of purchasing another company, selling itself or divesting a division or raising capital.
- Investment bankers use valuation analyses in pitch books and other presentations to guide clients toward what they should expect in terms of investor interest.
- Private equity firms, hedge funds, asset managers, and others engage in valuation techniques to determine which assets are undervalued, how much to pay for an asset, etc.

SAMPLE ANSWER: *Valuation is the procedure of calculating the worth of an asset, security, company, etc.*

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WHAT ARE SOME WAYS YOU CAN VALUE A COMPANY?

- Comparable Companies/Multiples Analysis (to calculate either Enterprise Value or Equity Value)
- Most often an analyst will take the average multiple from publicly traded comparable companies (based on size, industry, growth profile, etc) and use that multiple with the operating metric of the company being valued
- The most commonly used multiple is Enterprise Value/EBITDA. While Price/Earnings is the most broadly recognized valuation multiple, bankers tend to utilize multiples based on Enterprise Value (as opposed to Equity Value, as is the case with Price/Earnings) because Enterprise Value multiples are independent of capital structure and other factors which unrelated to business operations (like differences in tax regimes and certain accounting policies)
- Other multiples analysts will use include Price/Earnings, PEG, EV/EBIT, Price/Book, EV/Sales
- Steps to performing Comparable Companies Analysis:
  - Select appropriate universe of companies / comp set – a survey of the target's public competitors is generally a good place to start looking
  - Locate the necessary financial information – usually from SEC filings, research estimates and reports, press releases, and information services like Bloomberg or CapitalIQ
  - Spread the key statistics ratios and trading multiples – calculate market valuation measures such as Enterprise Value and Equity Value as well as key income statement and balance sheet information
  - Benchmark the comparable companies – using the calculation of last 12 months (LTM) financial performance, a calendarization of company financials and adjustments for non-recurring items

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- Determine valuation, usually a triangulation between the median and mean valuations implied by the comp set, with judgment exercised by the banker to eliminate any outliers from the universe

- Key similarities between comparable companies:
  - Business Profile – sector, product and service offering, customers and end markets, distribution channels, geography
  - Financial Profile – size, profitability, growth profile, return on investment, credit profile

- Some industry-specific valuation multiples include:
  - EV/EBITDAR (**companies with significant rent/lease expense** – airlines, casinos, restaurants, retail)
  - EV/EBITDAX (**companies with significant exploration and depletion expenses** – Natural Resources/Oil & Gas)
  - EV/Proven Reserves, EV/Production, EV/Capacity (energy, metals and mining)
  - EV/Visitors, EV/Users, EV/Subscribers (Internet, media, telecom)
  - EV/Revenue (companies who are younger, growing rapidly, less focused on preserving margins and more focused on top line growth) – often seen across technology companies

- Different multiples may be more or less appropriate for specific industries, and some multiples calculate Equity Value, while others calculate Enterprise Value. For example, if you use an EV/EBITDA multiple, you would be calculating the total value of the firm, including debt, since you are using a metric that excludes interest expense. If you were to use a multiple such as P/E (price/earnings) ratio, you would be valuing only the equity because the metric is earnings, which hypothetically could be distributed through dividends to those who own the firm's equity.
- Example: Comparable Company A is trading at an EV/EBITDA multiple of 6.0x, and the company

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you are valuing has EBITDA of $100 million; your company's EV would be valued at $600 million based on this valuation technique.

- Market Valuation / Market Capitalization
  - The market value of equity is used only for publicly traded companies. It is calculated by multiplying the number of shares outstanding by the current stock price.
  - Bankers tend to use a conservative estimate of fully diluted shares outstanding by making the assumption that all in the money options are exercised in addition to warrants and convertible securities.
  - For insight on absolute and relative market performance, bankers will look at the company's share price as a percentage of its 52-week high. This metric is widely used and helps gauge market sentiment and outlook for both the individual company and its broader sector. If a given company's percentage is significantly out of line with that of its peers, it is generally an indicator of company-specific issues.

- Precedent Transactions
  - A precedent transaction analysis is based on the idea that a company's worth can be determined by looking at the prices paid for similar companies in similar situations in the past. This methodology is as much an art as it is a science.
  - With this valuation technique an analyst will research historical transactions similar to the transaction in question. This includes looking at the size of the companies involved, their industry, the economic context of the transaction, premiums paid, purpose of the transaction (strategic or financial), etc.
  - As with trading comps, it is often challenging to obtain a robust universe of truly comparable deals, so sometimes it may make more sense to focus on a small group of highly relevant, similar transactions, rather than a broader selection of less similar deals. Studying each prior deal in detail is vital to determining the likenesses among transactions and coming up with

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an accurate valuation.

- When dealing with a transaction that is truly not comparable, it is not uncommon to consider transactions involving companies in difference, but related sectors that may share similar end markets, distribution channels, or financial profiles.
- Once an analyst has found transactions that are comparable, they look at how those companies were valued. What were the EV/EBITDA and EV/Sales multiples paid? They calculate a valuation multiple based on the sale prices in those transactions, and apply the multiple to the comparable metric of the company being valued.
- Most of the time this valuation technique will result in the highest valuation due to the inclusion of a "control premium" the buyer is willing to pay for the assumed "synergies" they hope will occur after the purchase. In the control premium, the acquirer receives the right to control decisions regarding the target's business and its underlying cash flows. The opportunity to realize synergies allows and supports the ability to pay a higher purchase price.
- Some advantages of this valuation technique include its reliance on public information (for many transactions) and its basis in reality, based on actual comparable deals that have closed in the past. However, market conditions at the time of the prior deal may be significantly different from those prevailing at the time of the current transaction. For example, multiples paid for a dot-com company during the bubble in the early 2000's would be significantly higher than the multiples paid for a similar company today. A good analyst will take this into account and discount the valuation accordingly.
- Another reason we tend to see higher multiples from transaction comps is due to the acquirer's basis for valuation. Specifically, the multiple paid by the buyer may be based on some expectations or projections of future financial performance (which is typically not publicly disclosed) rather than on reported LTM financial data.
- Below is a sample of what a simple precedent transaction summary chart may look like.

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($-millions)						Multiples			
Date	Target Name	Acquirer Name	Equity Value	Net Debt	Enterprise Value	EV/Sales	EV/EBITDA	EV/EBIT	Equity/Net Income
May-00	Fox	Hostel	84.3	0.0	84.3	2.3x	7.0x	7.5x	11.0x
Mar-05	Charlie	Wolf	34.2	50.0	84.2	2.1x	7.6x	8.0x	11.5x
Jun-07	Delta	Cross	53.5	40.2	93.7	1.9x	6.3x	7.0x	10.4x
Aug-08	Igloo	Swiss	23.2	0.0	23.2	3.5x	8.1x	9.0x	12.1x
Dec-09	Apple	North	100.3	80.4	180.7	2.5x	7.7x	8.5x	11.4x
					High	3.5x	8.1x	9.0x	12.1x
					Mean	2.5x	7.3x	8.0x	11.3x
					Median	2.3x	7.6x	8.0x	11.4x
					Low	1.9x	6.3x	7.0x	10.4x

- Discounted Cash Flow Analysis
  - See “Walk me through a DCF” question below for more information on the discounted cash flow method of valuation.

- LBO Valuation
  - An LBO (leveraged buyout) is when a firm (usually a private equity—PE—firm) uses a higher than normal amount of debt (known as leverage) to finance the purchase of a company.
  - The PE investors will purchase the equity of another company, using a percentage (anywhere from 10% to 40%) of its own capital and financing the remainder with debt through bank loans, bonds, or a combination of the two. The PE firm then uses the cash flows from the acquired company to pay off the debt over time with the goal of increasing the value of their equity.
  - The PE firm frequently uses the assets of the company being acquired as collateral for a bank loan that will be underwritten by an investment bank's leveraged finance unit and then syndicated out to investors.
  - When the PE firm is ready to sell the company, ideally the debt has been partially or fully paid, and the PE firm—as the majority equity owners of the company—can collect most of the profits from an IPO or sale of the business. Since a smaller equity check was needed up

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front due to the higher level of debt used to purchase the company, this can result in higher returns to the original investors than if they had paid for the company entirely with their own equity (i.e. without any debt). For more detailed information on LBOs, see the LBO analysis in the later in this guide.

- Other Techniques
  - Liquidation Valuation: This valuation technique uses the value of the company if they simply sold all its assets. This might happen in a Chapter 7 bankruptcy. The company would sell off its PP&E, inventory, etc. It may be sold at a discount to the value it is being held on the Balance Sheet because it is a forced sale (not necessarily true if an asset like a piece of property or a building has been sitting on the Balance Sheet depreciating for years meaning that its book value could be well below its market value).
  - Sum of the Parts: This valuation technique should be used if the company has multiple divisions with different margins, growth rates, etc. For example, one methodology you could use for a company like Apple would be to value each of their different businesses (iPhone, iPad, Apple Watch, desktop, laptop, software, services, accessories, etc) on its own and then combine the values of all those divisions.

- Below is the general answer to this question, but be ready to give the brief description of any of the methodologies as described above if they ask.

SAMPLE ANSWER: *There are a number of ways I can think of to value a company, and I'm sure you know even more. The simplest is probably market valuation, which is just the public Equity Value of a company based on the public markets. To get the Enterprise Value, you add the net debt on its books, preferred stock, and any minority interest. A few other ways to value a company include comparable company analysis, precedent transactions, discounted cash flow, leveraged buyout valuation, and liquidation valuation.*

- Please note the "Common Valuation Techniques" chart on the following page.

Common Valuation Techniques

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COMPARABLE COMPANIES	• Calculates either Enterprise Value or Equity Value. • Average multiple from comparable companies (based on size, industry, etc.) multiplied by the operating metric of the company you are valuing. • Most common multiple is Enterprise Value/EBITDA, but also used are P/E, EV/ EBIT, Price/Book, EV/Sales. • Different multiples may be more or less important in different industries. • Market-based – information used to drive valuation for a target is based on current and actual public market data, thereby reflecting the market's growth and risk expectations • Valuations that are *completely* market-based can be skewed during periods of irrational exuberance or bearishness and result in a potential disconnect from the company's ability to generate free cash flow • Pure play comparables may be difficult to identify if the target operates in a niche sector, in which case a market-based valuation is less meaningful • Relativity – easily measurable vs. other companies and quick/convenient valuation can be determined on the basis of easy-to-calculate inputs • At the same time, valuing a target based on the valuations of other companies may fail to capture the target's company-specific strengths, weaknesses, opportunities and threats
MARKET VALUATION	• The market value of equity is only for publicly traded companies and is the easiest valuation technique. • Market value is calculated simply by multiplying the number of shares outstanding by the current stock price. Also known as Market Cap, this gives the Equity Value of the firm. • Be sure to review the company's share price as a percentage of its 52-week high. This helps gauge market sentiment and outlook for both the individual company and its broader sector. If a given company's percentage is significantly out of line with that of its peers, it is generally an indicator of company-specific issues.
PRECEDENT TRANSACTION	• First, find historical transactions similar to the transaction in question, including size of the company, industry, economic contexts, etc. • What metrics (EBIT, EBITDA, etc) were used? Calculate a valuation multiple based on the sale price(s) in the precedent(s), and apply the multiple to the appropriate metric for the current company. • Most of the time this valuation technique will result in the highest valuation, due to the inclusion of a "control premium" a company will pay for the assumed "synergies" the expect to occur after purchase. • In the control premium, the acquirer receives the right to control decisions regarding the target's business and its underlying cash flows. The opportunity to realize synergies allows and supports the ability to pay a higher purchase price. • The multiple paid by the buyer may be based on some expectations or projections of future financial performance (which is typically not publicly disclosed) rather than on reported LTM financial data, potentially skewing our LTM-based data upwards.

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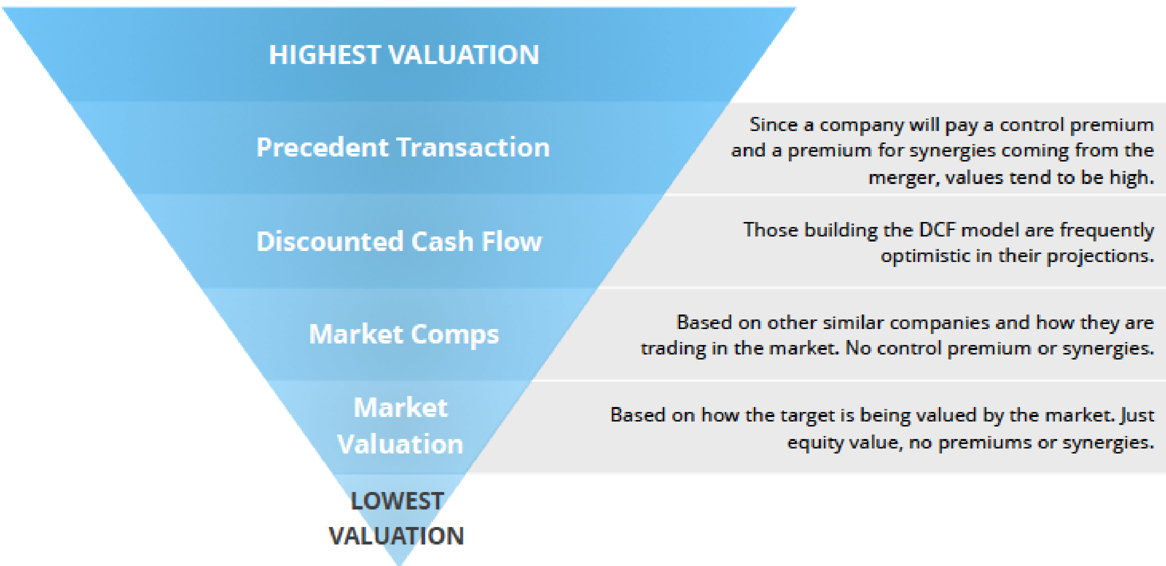
DISCOUNTED CASH FLOW	• See the "Walk me through a DCF" for more information on this valuation technique.
LBO VALUATION	• Essentially an LBO (leveraged buyout) is when a firm uses a higher than normal amount of debt to finance the purchase of a company, then uses the company's cash flows to pay off the debt over time. LBO candidates are typically highly cash flow-generative businesses • In an LBO, the total purchase price may be funded ~60%-90% through debt financings that can potentially reach sizes up to ~6x EBITDA, with the remaining 10%-40% funded through the equity check contributed by the Private Equity sponsor. • The acquired company's assets may be used as collateral for the loan. • Ideally, the debt has been partially or fully retired when LBO buyers are ready to sell the company, and—as sole equity owners of the company—they can collect most of the profits from the sale. • Since a smaller equity check was needed up front due to the higher level of debt used to purchase the company, this can result in higher returns to the original investors than if they had paid for the company entirely with their own equity (i.e., without any debt). For more detailed information on LBOs, see the LBO analysis in the Advanced section.

WHICH OF THE VALUATION METHODOLOGIES WILL RESULT IN THE HIGHEST VALUATION?



SAMPLE ANSWER: *Of the four main valuation techniques (Market Value, Market Comps, Precedent Transactions and DCF) the highest valuation will normally come from the Precedent Transactions technique, because a company will pay a premium for the projected synergies coming from the merger. A DCF analysis will typically give you the next highest valuation simply because those building the DCF model tend to be somewhat optimistic in their assumptions and projections. Market Comps and Market Value will usually*

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produce the lowest valuations.

HOW DO YOU VALUE A PRIVATE COMPANY?

- You can value a private company using the same techniques you use for a public company, with a couple of exceptions:
  - You cannot use a straight market valuation since the company is not publicly traded.
  - A DCF can be complicated by the absence of an equity beta, which would make calculating WACC difficult. In this case, you have to use the equity beta of a close comp in your WACC calculation.
- Financial information for private companies is more difficult to find because they are not required to make public online filings.
- An analyst may apply a discount in a comparable companies valuation if the comps are publicly held, because a public company will demand a 10-15% premium for the liquidity an investor enjoys when investing in a public company because it is easier to buy and sell in the public markets.

SAMPLE ANSWER: *You can value a private company with the same techniques you would use for a public company but with a few differences that make it more difficult. Financial information will likely be harder to find and potentially less complete and less reliable. Second, you can't use a straight market valuation for a company that isn't publicly traded. In addition, a DCF can be problematic because a private company won't have an equity beta to use in the WACC calculation. Finally, if you're doing a comps analysis using publicly traded companies, a 10-15% discount may be required as a 10-15% premium is paid for the public company's relative liquidity.*

WHAT DOES SPREADING COMPS MEAN?

- "Spreading comps" is the task of collecting and calculating relevant multiples for comparable companies.
- Sometimes an analyst can pull the relevant multiples from a resource like CapitalIQ. However, sometimes you have to research a company's data and financial information in their 10-K/10-Q

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to make sure they have adjusted for non-recurring charges or irregular accounting across an industry that can skew multiples across comparable companies. These charges can include one-time legal expenses, restructuring fees, asset write-downs, etc.

- These adjustments will be detailed in the footnotes section of the financial statements.
- A simple comps table is shown below. A sample comps table is also included in the Excel model provided with this guide.

SAMPLE ANSWER: *Spreading comps means calculating relevant multiples from comparable companies and summarizing them for easy analysis and comparison. It can be challenging when a company's data and financial information must be scoured to conduct the necessary research.*

Food Manufacturer Equity Comps Analysis

Ticker	Company Name	Current Price	LTM Rev	LTM Gross Profit	LTM Gross Margin	LTM EBITDA	EBITDA Margin	Market Cap	Long Term Debt	Cash	TEV	Debt/ EBITDA	TEV/ Revenue	TEV/ EBITDA
HNZ	H. J. Heinz Company	43.22	10,495.0	3,818.3	36.4%	1,899.7	18.1%	13,746.6	4,567.6	483.3	17,888.1	2.40x	1.70x	9.42x
SLE	Sara Lee Corp.	14.10	9,140.0	3,322.0	36.3%	1,451.0	15.9%	9,323.9	2,718.0	935.0	11,139.9	1.87x	1.22x	7.68x
HRL	Hormel Foods Corp.	20.24	6,676.8	1,173.1	17.6%	722.2	10.8%	5,393.6	350.0	355.2	5,391.8	0.48x	0.81x	7.47x
SJM	The J. M. Smucker Company	60.22	4,605.3	1,790.6	38.9%	1,020.6	22.2%	7,194.6	900.0	283.6	7,811.0	0.88x	1.70x	7.65x
BGS	B&G Foods Inc.	10.78	507.6	152.0	29.9%	105.7	20.8%	513.3	489.4	69.4	933.4	4.63x	1.84x	8.83x
FLO	Flow ers Foods, Inc.	16.29	2,588.9	1,213.3	46.9%	287.3	11.1%	2,241.3	326.8	8.4	2,559.7	1.14x	0.99x	8.91x
JJSF	J&J Snack Foods Corp.	42.10	679.0	222.6	32.8%	104.8	15.4%	775.3	0.0	54.3	721.0	0.00x	1.06x	6.88x
LNCE	Snyder's-Lance, Inc.	16.49	923.0	370.3	40.1%	94.9	10.3%	531.0	118.9	7.0	642.9	1.25x	0.70x	6.77x
THS	Treehouse Foods, Inc.	45.66	1,627.0	368.8	22.7%	197.3	12.1%	1,587.6	887.6	3.4	2,471.7	4.50x	1.52x	12.53x
Low:					**17.6%**		**10.3%**					**0.00x**	**0.70x**	**6.77x**
Mean:					**33.1%**		**15.4%**					**2.20x**	**1.29x**	**8.41x**
Median:					**34.6%**		**15.7%**					**1.56x**	**1.31x**	**7.81x**
High:					**46.9%**		**22.2%**					**4.83x**	**1.84x**	**12.53x**

Note: LTM Period Ending 6/30/10
TEV for Heinz, Sara Lee and Hormel include 57.2mm, 33.0mm and 3.4mm of minority interest

WOULD YOU BE CALCULATING ENTERPRISE VALUE OR EQUITY VALUE WHEN USING A MULTIPLE BASED ON FREE CASH FLOW OR EBITDA?

SAMPLE ANSWER: *EBITDA and free cash flow represent cash flows that are available to repay holders of a company's debt and equity, so a multiple based on one of those two metrics would describe the value of the firm to all investors. A multiple such as P/E ratio, based on earnings alone, represents the amount available to common shareholders after all expenses are paid, so if you used this multiple, you would be calculating the value of the firm's equity.*

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WALK ME THROUGH A DISCOUNTED CASH FLOW MODEL

- This is one of the most common questions in investment banking interviews. Don't mess it up!
- To begin, project free cash flows for a specified period, usually five to ten years. Free cash flow is equal to EBIT (earnings before interest and taxes) multiplied by (1–the tax rate) plus (depreciation and amortization) minus capital expenditures plus or minus the change in net working capital.
- Next, predict free cash flows for the years beyond the five or ten years projected. This requires establishment of a terminal value, as is detailed in the next question below.
- Once future cash flows have been projected, calculate the present value of those cash flows. First, establish an appropriate discount rate—the Weighted Average Cost of Capital, or WACC. This calculation is discussed in the following two questions.
- To find the present values of the cash flows (which is equal to the company's Enterprise Value), we discount them by the WACC, as follows.

$$Enterprise\ Value = \frac{CF_1}{(1+WACC)^1} + \frac{CF_2}{(1+WACC)^2} + \cdots + \frac{CF_n}{(1+WACC)^n}$$

- The final cash flow (CFn) in the analysis will be the sum of the terminal value calculation and the final year's free cash flow.
- For a much more in depth description of a Discounted Cash Flow analysis, view a DCF tutorial online (Investopedia is a great resource) and study the Excel model you received when you purchased this guide.

SAMPLE ANSWER: *First, project the company's free cash flows for about 5 years using the standard formula. (Free cash flow is EBIT times 1 minus the tax rate, plus Depreciation and Amortization, minus Capital Expenditures, plus or minus the Change in Net Working Capital.) Next, predict free cash flows beyond 5 years using either a terminal value multiple or the perpetuity method. To calculate the perpetuity, establish a terminal growth rate, usually about the rate of inflation or GDP growth, a low single-digit percentage. Now multiply the Year 5 cash flow by 1 plus the growth rate and divide that by your discount*

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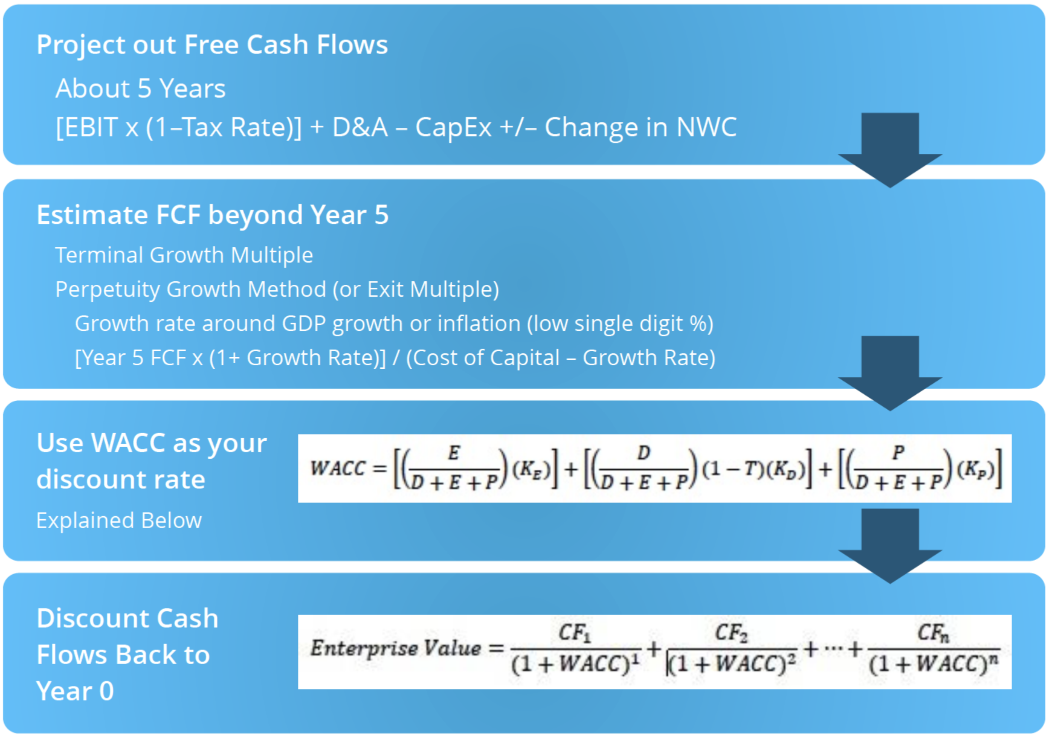
rate minus the growth rate. Your discount rate is the Weighted Average Cost of Capital, or WACC. Use that rate to discount all your cash flows back to year zero. The sum of the present values of all those cash flows is the estimated present Enterprise Value of the firm according to a discounted cash flow model.

Discounted Cash Flow Summary Chart



HOW DO YOU CALCULATE A FIRM'S TERMINAL VALUE?

$$Terminal\ Value = \frac{FCF_{10}(1+g)}{(WACC-g)}$$

- To establish a terminal value, either you can use the formula above, which is the perpetuity growth methodology, or you can use the terminal multiple method.
- In the terminal multiple method, you assign a valuation multiple (such as EV/EBITDA) to the final

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year's projection, and use that as the "terminal value" of the firm.

- In either case, you must remember to discount this "cash flow" back to year zero as you have with all other cash flows in the DCF model.

SAMPLE ANSWER: *There are two ways to calculate terminal value. The first is the terminal multiple method. To use this method, you choose an operation metric (most commonly EBITDA) and apply a comparable company's multiple to that number from the final year of projections. The second method is the perpetuity growth method where you choose a modest growth rate, usually just a bit higher than the inflation rate or GDP growth rate, and assume that the company can grow at this rate infinitely. You then multiply the FCF from the final year by 1 plus the growth rate, and divide that number by the discount rate (WACC) minus the assumed growth rate.*

SAMPLE FOLLOW UP QUESTION: What does this figure represent/why is it significant?

SAMPLE FOLLOW UP ANSWER: *Since it is infeasible to project a company's FCF indefinitely, we use a terminal value to capture the value of the company beyond the projection period. The terminal value typically accounts for a substantial portion of a company's value in a DCF, sometimes three quarters or more. Therefore, it is important that the company's terminal year financial data represents a steady state level of financial performance, as opposed to a cyclical high or low.*

SAMPLE FOLLOW UP QUESTION: How can you perform a sanity check on an assumed terminal value?

SAMPLE FOLLOW UP ANSWER: *You could compare the two terminal values implied by the Exit Multiple Method and the Perpetuity Growth Method. If they are materially different, review the implied perpetuity growth rate and implied exit multiples. If the implied perpetuity growth rate, as derived from the Exit Multiple Method is too high or too low, it could be an indicator that the exit multiple assumptions are unrealistic. Similarly, if the implied exit multiple from the Perpetuity Growth Method is not in line with normalized trading multiples for the target and its comp set, the perpetuity growth rate should be revised.*

- **Implied Perpetuity Growth Rate** = ((Terminal Value Calculated from Perpetuity Growth Method x WACC) – FCF from Terminal Year) / (Terminal Value Calculated from Perpetuity Growth Method + FCF from Terminal Year)

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- **Implied Exit Multiple** = Terminal Value Calculated from Perpetuity Growth Method / EBITDA in Final Year

WHAT IS WACC AND HOW DO YOU CALCULATE IT?

- WACC is the acronym for Weighted Average Cost of Capital. It is used as the discount rate in a discounted cash flow analysis to calculate the present value of a company's cash flows and terminal value. It reflects the overall cost of a company raising new capital, which is also a representation of the riskiness of investment in the company.
- WACC represents the blended cost (or return on the invested capital) to both debt holders and equity holders, based on the cost of debt and the cost of equity for that specific firm.

$$WACC = \left[\left(\frac{E}{D+E+P}\right)(K_E)\right] + \left[\left(\frac{D}{D+E+P}\right)(1-T)(K_D)\right] + \left[\left(\frac{P}{D+E+P}\right)(K_P)\right]$$

E = Market Value of Equity
D = Book Value of Debt
P = Value of Preferred Stock
K_E = Cost of Equity (Calculate using CAPM)
K_D = Cost of Debt (Current Yield of Debt)
K_P = Cost of Preferred Stock (Interested Rate on Preferred Stock)
T = Corporate Tax Rate

SAMPLE ANSWER: *WACC is the acronym for Weighted Average Cost of Capital. It is used as the discount rate in a discounted cash flow analysis to calculate the present value of a company's cash flows and terminal value. It reflects the overall cost of a company's raising new capital, which is also a representation of the riskiness of investing in the company. Mathematically, WACC is the percentage of equity in the capital structure times the cost of equity (calculated by the Capital Assets Pricing Model) plus percentage of debt in the capital structure times one minus the corporate tax rate times the cost of debt—current yield on outstanding debt—plus percentage of preferred stock in the capital structure times the cost of preferred stock if there is any preferred stock outstanding.*

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SAMPLE FOLLOW UP QUESTION: How do you incorporate an accurate WACC for a diverse company with several business segments/reporting lines with materially different risk profiles?

SAMPLE FOLLOW UP ANSWER: *In this case, it may be worth approaching the valuation using a "sum of the parts" analysis in which a separate DCF is performed for each business segment. Each business segment would have its own WACC to most accurately reflect the risk profile of each subsidiary business individually.*

ALL ELSE EQUAL, SHOULD THE WACC BE HIGHER FOR A COMPANY WITH $100 MILLION OF MARKET CAP OR A COMPANY WITH $100 BILLION OF MARKET CAP?

- Normally the larger company will be considered "safer" and therefore will have a lower WACC. However, depending upon their respective capital structures, the larger company could have a higher WACC.

SAMPLE ANSWER: *Without knowing more information about the companies, it is impossible to say. If the capital structures are the same, then the larger company should be less risky and therefore have a lower WACC. However, if the larger company has a lot of high-interest debt, it could have a higher WACC.*

ALL ELSE EQUAL, SHOULD THE COST OF EQUITY BE HIGHER FOR A COMPANY WITH $100 MILLION OF MARKET CAP OR A COMPANY WITH $100 BILLION OF MARKET CAP?

SAMPLE ANSWER: *Typically, a smaller company is expected to produce greater returns than a large company, meaning the smaller company is more risky and therefore would have a higher cost of equity.*

HOW DO YOU CALCULATE FREE CASH FLOW?

SAMPLE ANSWER: *Free cash flow is EBIT times 1 minus the tax rate plus Depreciation and Amortization minus Capital Expenditures minus the Change in Net Working Capital.*

SAMPLE FOLLOW UP QUESTION: What metrics are commonly employed when projecting net working capital in a DCF valuation?

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SAMPLE FOLLOW UP ANSWER: *For a company with common working capital accounts, such as accounts receivable, inventories, prepaid assets, other current assets, accounts payable, accrued expenses, deferred revenue, other current liabilities, etc., common ratios include:*

- **(i) Days Sales Outstanding (DSO):** (Accounts Receivable/Sales) x 365 – provides a gauge of how well a company is managing the collection of its receivables by measuring the number of days it takes to collect payment after the sale of a product or service. Minimizing DSO increases cash flow
- **(ii) Days Inventory Held (DIH):** (Inventory/Cost of Goods Sold) x 365 – measures the number of days it takes a company to sell its inventory. Minimizing DIH increases cash flow as a company turns it inventory as quickly as possible to minimize the amount of cash it ties up
- **(iii) Inventory Turns:** Cost of Goods Sold / Inventory – an alternative approach for measuring a company's efficiency at selling inventory. Indicates the number of times a company turns over its inventory in a year
- **(iv) Days Payable Outstanding (DPO):** (Accounts Payable/Cost of Goods Sold) x 365 – measures the number of days it takes a company to make payment on its outstanding purchases of goods and services. An increase in Accounts Payable is a source of cash, so companies should aspire to maximize their DPO as to increase short-term liquidity.

SAMPLE FOLLOW UP QUESTION: When projecting out depreciation and amortization, what balance sheet line items are impacted by these annual non-cash expenses?

SAMPLE FOLLOW UP ANSWER: *Depreciation expense from the Income Statement (or Notes) reduces the Balance Sheet Account for Plant Property & Equipment, a non-current asset. Amortization expense, also from the Income Statement (or Notes) reduces the Balance Sheet Account for Intangible Assets. Only certain identifiable intangible assets are currently amortizable under U.S. GAAP.*

WHAT IS NET WORKING CAPITAL?

- *Net Working Capital = Current Assents – Currents Liabilities*
- Current assets include items on the Balance Sheet like inventory, accounts receivable, prepaid

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expenses, and other short-term assets. Current liabilities include items such as accounts payable, accrued expenses, deferred revenue and other short-term liabilities.

- An increase in net working capital is a use of cash. This could be from increasing current assets like inventory or accounts receivable. If you increase inventory for example, it is not (yet) a cost on the Income Statement, but is still a use of cash due which needs to be accounted for on the CF statement.
- A decrease in net working capital is a source of cash. This could include changes such as increasing accounts payable or reducing inventory. If you reduce inventory, it means you are selling more goods than you are producing, which means you are realizing a cost on your Income Statement. This is why in calculating free cash flow you subtract an increase in net working capital. If you are increasing accounts payable, you are preserving your liquidity by taking a little bit longer to pay your vendors for your raw materials/inputs.
- If net working capital went up, a company must have "used" cash to produce the increase (for example, by purchasing more inventory than they sold).

SAMPLE ANSWER: *Net Working Capital is current assets minus current liabilities. It is a measure of a company's ability to pay off its short-term liabilities with its short-term assets. A positive number means they can cover their short-term liabilities with their short-term assets. A negative number indicates that the company may have trouble paying off its creditors, which could result in bankruptcy if cash reserves are insufficient.*

WHAT HAPPENS TO FREE CASH FLOW IF NET WORKING CAPITAL INCREASES?

- Intuitively, you can think of working capital as the net dollars tied up to run the business. As more cash is tied up (either in accounts receivable, inventory, etc.), free cash flow will be reduced.
- Remember, if an asset goes up, this is a use of cash; if a liability goes up; it is a source of cash.

SAMPLE ANSWER: *You subtract the change in Net Working Capital when you calculate Free Cash Flow, so if Net Working Capital increases, your Free Cash Flow decreases and vice versa.*

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WHEN WOULD A COMPANY COLLECT CASH FROM A CUSTOMER AND NOT SHOW IT AS REVENUE? IF IT ISN'T REVENUE, WHAT IS IT?

- Normally this will occur when a customer pays for a good or service to be delivered in the future.
- Some examples would be annual magazine subscriptions, annual contracts on cell phone service, online dating site memberships, etc.
- The revenue is not recognized until the good or service is delivered to the customer.
- Until it is delivered, it is recorded as deferred revenue (liability) on the Balance Sheet.
- It will be recognized as revenue as it is delivered, and the deferred revenue line item on the Balance Sheet will be reduced accordingly.
- Deferred revenue in many businesses considered part of Working Capital (as a Current Liability) in the calculation of Free Cash Flow.

SAMPLE ANSWER: *This typically occurs when a company is paid in advance for future delivery of a good or service, such as a magazine subscription. If a customer pays for delivery of 12 months of magazines in advance, cash from that purchase goes onto the Balance Sheet as cash, but also increases deferred revenue, a liability. As each issue is delivered to the customer over the course of the year, the deferred revenue line item will go down, reducing the company's liability, while a portion of the subscription payment will be recorded as revenue.*

WHAT IS THE DIFFERENCE BETWEEN ACCOUNTS RECEIVABLE AND DEFERRED REVENUE?

SAMPLE ANSWER: *Accounts receivable is money a company has earned from delivery of goods or services but has not collected yet. Deferred revenue is the opposite, money that has not yet been recorded as revenue because it was collected for goods or services not yet delivered.*

WHY MIGHT THERE BE MULTIPLE VALUATIONS OF A SINGLE COMPANY?

SAMPLE ANSWER: *Each method of valuation will generate a different value because it is based on different assumptions, different multiples, or different comparable companies and/or transactions. Generally, the precedent transaction methodology and discounted cash flow method lead to higher valuations than comparable companies analysis or market valuation does. The precedent transaction result may be higher because the approach usually will include a "control premium" above the company's market value to entice shareholders to sell and will account for the "synergies" that are expected from the merger. The DCF approach normally produces higher valuations because analysts' projections and assumptions are*

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usually somewhat optimistic.

WHY DO YOU PROJECT OUT FREE CASH FLOWS FOR THE DCF MODEL?

- The reason you project FCF for the DCF is because FCF is the amount of actual cash that could hypothetically be paid out to debt holders and equity holders from the earnings of a company.

WHEN WOULD YOU NOT WANT TO USE A DCF?

- If you have a company that has very unpredictable cash flows, then attempting to project those cash flows and create a DCF model would not be effective or accurate. In this situation you will most likely want to use a multiples or precedent transactions analysis.

WHY MIGHT TWO COMPANIES WITH SIMILAR GROWTH AND PROFITABILITY HAVE DIFFERENT VALUATIONS?

SAMPLE ANSWER: *The difference in valuation could reflect some sort of a competitive advantage that isn't represented on the financial statements. Perhaps the more valuable company is a market leader in a key region or owns uniquely valuable intellectual property or enjoys a significantly stronger management track record.*

HOW DO YOU DETERMINE WHICH VALUATION METHODOLOGY TO USE?

SAMPLE ANSWER: *Because each method has unique ability to provide useful information, you don't choose just one. The best way to determine the value of a company is to use a combination of valuation techniques. For example, if you have a precedent transaction valuation that you feel is extremely accurate, you may give that result more weight. Or if you are extremely confident in your DCF analysis, you will place more emphasis on its outcome. Valuing a company is as much an art as it is a science.*

WHAT IS AN INITIAL PUBLIC OFFERING (IPO)?

- An IPO is the first public sale of stock in a previously private company. This is known as "going public."
- The IPO process is incredibly complex, and investment banks charge high fees to lead companies through it. Companies go public for a number of reasons—raising capital, cashing out for the

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original owners, and investor and employee compensation.

- Some negatives against "going public" include sharing future profits with public investors, loss of confidentiality, loss of control, IPO fees to investment banks, and legal liabilities.

SAMPLE ANSWER: *IPO is the acronym for Initial Public Offering. It is the first time a privately-held company sells shares of stock to the public market. Usually a company goes public to raise capital for growing the business or to allow the original owners and investors to cash out some of their investment.*

WHAT IS A PRIMARY MARKET AND WHAT IS A SECONDARY MARKET?

- The primary market is where an investment bank sells new securities before they go to market. With an IPO or bond issuance, the majority of these buyers are institutional investors who purchase large amounts of the security.
- The secondary market is the market on which a stock or bond trades after the primary offering—the New York Stock Exchange, American Stock Exchange, or Nasdaq, in the United States.
- The primary market is the market where a new stock or bond is sold the first time it comes to market. The secondary market is where the security will trade after its initial public offering (NYSE, Nasdaq).

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If You Couldn't Use a DCF or Multiples, How Would You Value a Company

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DCF vs. Trading vs. Transaction Multiples... the Highest Valuations?

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Can You Walk Me Through a Discounted Cash Flow (DCF)?

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Investment Banking Mock Interview (54 Min): Analyst

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Investment Banking Mock Interview (30 Min): Associate

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Intermediate Concepts, Questions, and Case Studies

Intermediate Concepts, Questions, and Case Studies

WHAT IS THE CAPITAL ASSETS PRICING MODEL?

- Used to calculate the required/expected return on equity (ROE), or the cost of equity of a company
- *Re = Rf + B (Rm – Rf)*

SAMPLE ANSWER: *The Capital Assets Pricing Model, referred to as CAPM, is used to calculate the required return on equity or the cost of equity. The return on equity is equal to the risk free rate (usually the yield on a 10-year U.S. government bond) plus the company's beta (a measure of the stock's volatility in relation to the stock market) times the market risk premium.*

WHERE DO YOU FIND THE RISK-FREE RATE?

- The risk-free rate is usually the current yield on the 10-year government treasury, which can be found on the front page of The Wall Street Journal, on Yahoo! Finance, etc. This is considered "risk-free" because the U.S. government is considered to be a risk-free borrower, meaning the government is expected never to default on its debt.
- Recently, S&P downgraded the United States from its AAA "risk-free" rating to AA+. The other two major ratings agencies have maintained their ratings on U.S. government debt, however. See the section in the current events section of this guide for more information.

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WHAT IS BETA?

- Represents relative volatility or risk of a given investment with respect to the market.
- ⍰ < 1 means less volatile than market (lower risk, lower reward).
- ⍰ > 1 means more volatile than market (higher risk, higher reward).
- A beta of 1.2 means that an investment theoretically will be 20% more volatile than the market. If the market goes up 10%, that investment should go up 12%.
- Beta is a measure of the volatility of an investment compared with the market as a whole. The market has a beta of 1, while investments that are more volatile than the market have a beta greater than 1 and those that are less volatile have a beta less than 1.

β < 1	**β > 1**
Consumer Staples	**Wireless Networking**
Healthcare	**Biotechnology**
Utilities	**Computer Software / Services / Hardware**
Tobacco	**E-Commerce**
Petroleum Production	**Entertainment Technology**

WHEN SHOULD A PURCHASE BE CAPITALIZED RATHER THAN EXPENSED?

- Typically any purchase that will be used for a long period of time (more than a year) will be categorized as a capital expenditure and will be capitalized on the balance sheet.

HOW DOES DEPRECIATION AFFECT THE CASH BALANCE IF IT IS A NON-CASH EXPENSE?

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SAMPLE ANSWER: *Since depreciation is an expense, it will reduce the amount of taxes a company will pay. Since taxes are a cash expense, anything that affects them—including depreciation—will affect the cash balance.*

HOW WOULD A $10 INCREASE IN DEPRECIATION EXPENSE AFFECT THE EACH OF THE THREE FINANCIAL STATEMENTS?

- NOTE: There are many forms of this question. An interviewer could ask how the statements are affected by a $20 decrease in inventory, or a $50 million capital expenditure project. Since you will not be able to memorize each and every possible question, you must know how the changes in line items flow through the financial statements. Use the WSO model provided with this guide to help you master that.
- Break this question down into pieces.
- Start with the Income Statement.
  - The $10 increase in depreciation is an expense, which therefore lowers operating profit by $10 and reduces taxes.
  - Taxes decrease by $10 x Tax Rate and net income decreases by $10 x (1–Tax Rate).
  - Assuming a 40% tax rate, the drop in net income will be $6 [$10 x (1–0.40)].
- Next move to the Statement of Cash Flows.
  - The $6 reduction in net income reduces cash from operations by $6.
  - However, depreciation is a non-cash item, so it will increase cash from operations by $10 because you add back depreciation.
  - Ending cash is therefore increased by $4.
-

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Now to the Balance Sheet.

- Cash increases by $4.
- PP&E decreases by $10 because of depreciation.
- Overall assets fall by $6.
- This needs to balance with the other side of the Balance Sheet; therefore, retained earnings will fall by $6 due to the drop in net income.

SAMPLE ANSWER: *Let's start with the Income Statement. The $10 increase in depreciation will be an expense and will reduce net income by $10 times (1–the tax rate). Assuming a 40% tax rate, this will mean a reduction in net income of 60% or $6. So $6 flows to cash from operations, where net income will be reduced by $6 but depreciation will increase by $10, resulting in an increase of ending cash by $4. Cash then flows onto the Balance Sheet where it increases by $4, PP&E decreases by $10, and retained earnings decreases by $6, keeping everything in balance.*

NOTE: See the chart below to help you follow the flow. You can also use the accompanying Excel spreadsheet to change depreciation and see what happens to the three statements.

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On the Income Statement
- $10 Depreciation Expense, 40% Tax Rate
- Reduction in Net Income of $10 x (1–40%)=$6

Reduction in net income flows to cash from operations
- Net income reduced by $6
- Depreciation increases by $10
- Net increase in cash from operations of $4
- Ending cash increases by $4

Ending cash flows onto the balance sheet
- Cash increases by $4
- Property, Plant and Equipment loses $10 in value
- Net decrease in assets of $6, matches the net drop in shareholder equity due to reduction of retained earnings from the $6 drop in net income

WHY DO CAPITAL EXPENDITURES INCREASE ASSETS (PP&E), WHILE OTHER CASH OUTFLOWS, LIKE PAYING SALARY, TAXES, ETC., DO NOT CREATE ANY ASSET, AND INSTEAD INSTANTLY CREATE AN EXPENSE ON THE INCOME STATEMENT THAT REDUCES EQUITY VIA RETAINED EARNINGS?

- Capital expenditures are capitalized on the balance sheet because it expected that their benefits will be realized over a long period of time, likely a number of years. If a company purchases a truck, the Company will see the benefit of that truck over the course of its useful life, and therefore will expense the truck over the course of that life in the form of depreciation on the income statement.
- This is in contrast to a salary or wage expense, which is realized immediately because the Company is seeing the benefit of the work that employee is being paid for just in that short period of time.

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HOW IS IT POSSIBLE FOR A COMPANY TO SHOW POSITIVE NET INCOME BUT GO BANKRUPT?

- Two examples include deterioration of working capital (i.e. increasing accounts receivable, lowering accounts payable), and financial shenanigans.
- A company's net income is not a direct determinant of free cash flow. A few examples of how a Company could go bankrupt even with positive net income include:
  - High capital expenditure requirements for replacement or repair of existing property, plant and equipment
  - Debt maturities that the company cannot afford to repay or refinance
  - Seasonal swings in working capital
  - Macroeconomic conditions may cause a temporary decline in financial performance, which could ultimately lead to a breach of a financial covenant of an existing bank loan, creating an event of default
  - Highly punitive fixed cost structures, typically facilitated by long-term, unprofitable leases and unionized employee bases

I BUY A PIECE OF EQUIPMENT; WALK ME THROUGH THE IMPACT ON THE 3 FINANCIAL STATEMENTS.

- Initially, there is no impact (income statement); cash goes down, while PP&E goes up (balance sheet), and the purchase of PP&E is a cash outflow (cash flow statement). Over the life of the asset: depreciation reduces net income (income statement); PP&E goes down by depreciation, while retained earnings go down (balance sheet); and depreciation is added back (because it is a non-cash expense that reduced net income) in the cash from operations section (cash flow statement).

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WHY ARE INCREASES IN ACCOUNTS RECEIVABLE A CASH REDUCTION ON THE CASH FLOW STATEMENT?

- Since the cash flow statement starts with net income, an increase in accounts receivable is an adjustment to net income to reflect the fact that the company never actually received those funds.
- Accounts receivable is cash that the company has earned, but has not yet collected. If accounts receivable goes up, the company has not actually collected the cash for the income it has earned, and this is a negative adjustment on the cash flow statement in cash flow from operations.
- Accounts payable is the opposite of the above and is therefore is a positive adjustment on the cash flow statement in cash flow from operations.

IN WHAT SCENARIO COULD A COMPANY HAVE NEGATIVE SHAREHOLDERS EQUITY?

SAMPLE ANSWER: *If a company has had negative net income for a long time, it would have a negative retained earnings balance, which would lead to negative shareholders equity. A leveraged buy-out could have the same effect, and so would a large dividend payment to the owners of the business.*

SAMPLE FOLLOW UP QUESTION: If a company with a highly levered capital structure were attempting to execute a large dividend recap (which may or may not create a negative shareholders equity balance), what might a debt holder do to enforce any protections he/she has as a debt investor

SAMPLE FOLLOW UP ANSWER: *If a company has a highly levered capital structure, the legal documents governing the debt financing will generally limit the amount of total leverage (or indebtedness) that could be incurred by the company. These limits are called negative covenants, and will also be so specific as to clarify how much debt could be incurred that is senior to the existing debt in the capital structure and how much could be junior debt in the capital structure.*

HOW WOULD YOU CALCULATE THE DISCOUNT RATE FOR AN ALL-EQUITY FIRM?

SAMPLE ANSWER: *If a firm is all equity, then you would use CAPM to calculate the cost of equity, and that would be the discount rate.*

WHAT IS THE MARKET RISK PREMIUM?

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SAMPLE ANSWER: *The market risk premium is the excess return that investors require for choosing to purchase stocks over "risk-free" securities. It is calculated as the average return on the market (normally the S&P 500, typically around 10-12%) minus the risk free rate (current yield on a 10-year Treasury).*

WHAT KIND OF AN INVESTMENT WOULD HAVE A NEGATIVE BETA?

- An investment with a negative beta is one that moves opposite to the stock market as a whole. If the stock market moves up, the value of the negative beta investment would decline and vice versa.

SAMPLE ANSWER: *Gold is an investment that has a negative beta. When the stock market goes up, the price of gold typically declines as people flee from the "safe haven" of gold. The opposite happens when the market goes down, indicating a negative correlation.*

SAMPLE ANSWER: *Recession-resistant stocks, for example, certain sub-sectors within healthcare that generate business as people get sick regardless of macroeconomic conditions. Additional examples of recession-resistant industries include accounting and other general/temporary business staffing services, bulk food sales, etc.*

HOW MUCH WOULD YOU PAY FOR A COMPANY WITH $50 MILLION IN REVENUE AND $5 MILLION IN PROFIT?

- If this was the only information you were given, you could use multiples or a precedent transactions analysis. For more information about these types of valuation techniques, refer to the "how would you value a company" question above.

SAMPLE ANSWER: *Since you have no information about historical or projected performance, and no details about the firm's capital structure, it would be impossible to do a DCF analysis. Assuming you know the firm's industry, you could identify a group of comparable companies and do a multiples analysis using the ratios from those most relevant to the company being valued.*

HOW WOULD YOU VALUE A COMPANY WITH NO REVENUE?

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SAMPLE ANSWER: *In order to value a company with no revenue, such as a start up, you must project the company's cash flows for future years and then construct a discounted cash flow model of those cash flows using an appropriate discount rate. Alternatively, you could use other operating metrics to value the company as well. If you took a start-up website with 50,000 subscribers, but no revenue, you could look at a similar website's value per subscriber and apply that multiple to the website you are valuing.*

WHAT IS THE DIFFERENCE BETWEEN ADJUSTED PRESENT VALUE AND WACC?

- WACC incorporates the effect of interest tax shields into the discount rate.
    - Typically calculated from actual data from Balance Sheets and used for a company with a consistent capital structure over the period of the valuation

- APV adds present value of financing effects to Net Present Value assuming all Equity Value
- Useful where costs of financing are complex and if capital structure is changing
- Used for Leveraged Buyouts
- See investopedia.com for more information on APV

HOW WOULD YOU CALCULATE THE WACC OF A PRIVATE COMPANY?

SAMPLE ANSWER: *Since a private company has no market capitalization and no beta, you would most likely use the WACC for a comparable public company.*

DESCRIBE A COMPANY'S TYPICAL CAPITAL STRUCTURE.

- A company may finance itself using multiple layers of debt and equity, each of which will have a different cost and repayment preference in the event of bankruptcy. The paragraph below would be a relatively good answer, and the chart that follows illustrates the different layers of the capital structure.

SAMPLE ANSWER: *A company's capital structure is made up of debt and equity, and there may be multiple levels of each. Debt can be senior, mezzanine, or subordinated, with senior being paid off first in the event of bankruptcy, then mezzanine, then subordinated. Since senior debt is most secure and will be paid off first in bankruptcy, it offers the lowest interest rate. The most senior debt is bank loans; the rest is bonds, which can be issued to the general public. Equity is either preferred or common stock. Preferred stock combines some features of both debt and equity: it can appreciate in value, and also pays out a consistent dividend but it has very little or no rights in a bankruptcy. Common stock is traded on the exchanges, if the*

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company is public. In the event of bankruptcy, common stockholders have the least claim to assets in the event of liquidation, and therefore they bear the highest level of risk and earn the highest return on investment. Common shareholders are the company's owners and are entitled to profits, which may be reinvested in the business or paid as dividends.

SENIOR BANK LOANS	• Underwritten by an investment bank and syndicated to institutional buyers. • First priority in the event of a bankruptcy. • Often "secured" in case of liquidation by company assets pledged as collateral. • Can take several different structures, including, but not limited to: (i) Revolving Credit Facilities, typically secured by working capital assets and (ii) Term Loans, typically secured by all company assets. • Many times will have a "floating" interest rate based on LIBOR + a certain rate.
MEZZANINE DEBT/ BONDS	• Arranged by an investment bank and sold on the bond market. • May be secured or unsecured. • Bonds normally will have a fixed interest rate and a medium-to-long term maturity (7-12 years). • Bonds may have call or put options, may be convertible into equity, etc. • Mezzanine debt may have co-investment equity features
SUBORDINATED/ HIGH YIELD BONDS	• Similar to Mezzanine Debt/Bonds but lower in the capital structure (subordinated). • Since they are subordinated, they will have fewer rights in the event of a bankruptcy. • Investors will require a higher interest rate on this layer of debt.
PREFERRED STOCK	• Preferred stock is like a hybrid of a bond and common equity. • The preferred will pay a constant dividend to its shareholders, and the principal value of the preferred can gain value as well. • Preferred stock may also carry a conversion feature, where shareholders can convert their preferred into common. • Preferred will be paid prior to common shareholders having any recovery in a bankruptcy, but it is typically subordinated to all other company debt.
COMMON STOCK	• Common stock is the form of equity traded on public exchanges such as NYSE & Nasdaq. • Common shareholders purchase shares and are the company's "owners," with voting rights that can be exercised in corporate decisions. • Stock is underwritten by a bank hired to run the highly complex IPO process. The new shares issued are then sold mainly to institutional buyers. • Common stock is lowest in the capital structure and has the fewest rights in the event of bankruptcy.

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WHEN SHOULD A COMPANY ISSUE EQUITY RATHER THAN DEBT TO FUND ITS OPERATIONS?

- If the company feels its stock price is inflated, it would raise a large amount of capital relative to the percentage of ownership sold.
- If new projects the company plans on investing in may not produce immediate or consistent cash flows to make interest payments…
- If the company wants to adjust its capital structure, or pay down debt…
- If the company's owners want the ability to sell off a portion of their ownership and monetize their investment…

SAMPLE ANSWER: *There are several reasons for issuing stock rather than debt. First, if a company believes its stock price is inflated, issuing stock can raise a lot of capital relative to the ownership sold. Second, if the projects to be funded may not generate predictable cash flows in the immediate future, the company would want to avoid the obligation of consistent coupon payments required by the issuance of debt. Issuing stock is also an effective way to adjust the debt/equity ratio of a company's capital structure or to monetize the owners' investment.*

SAMPLE FOLLOW UP QUESTION: Alternatively, what kinds of companies can typically sustain and adequately service the debt burden incurred in an LBO transaction structure?

SAMPLE FOLLOW UP ANSWER: *Typically, candidates for an LBO are profitable business with a strong track record of generating cash flow sufficient to sustain moderate debt levels over multiple economic cycles. This will allow the company to build equity value as the company services the debt incurred at the initial transaction. Other business characteristics for creditworthy borrowers in a levered capital structure include high margin businesses with defendable market positions and a long-term, recurring customer base.*

WHEN SHOULD AN INVESTOR BUY PREFERRED STOCK?

- Preferred stock could be looked at as a cross between debt and equity. Preferred stock will normally provide investors with a fixed dividend rate (like a bond), but also allow for some capital appreciation (like a stock). Preferred stock may also have a conversion feature which allows shareholders to convert their preferred stock into common stock.

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- Preferred typically does not have voting rights like those of common stock.
- Preferred is senior to common stock within the company's capital structure.

SAMPLE ANSWER: *An investor should buy preferred for the upside potential of equity while limiting risk and assuring stability of current income in the form of a dividend. Preferred stock's dividends are more secure than those from common stock, and owners of preferred stock enjoy a superior right to the company's assets, though inferior to those of debt holders, should the company go bankrupt.*

WHY WOULD A COMPANY DISTRIBUTE ITS EARNINGS THROUGH DIVIDENDS TO COMMON STOCKHOLDERS?

SAMPLE ANSWER: *The distribution of a dividend signals that a company is healthy and profitable, thus attracting more investors, potentially driving up the company's stock price.*

WHAT IS OPERATING LEVERAGE?

- Operating leverage is the percentage of costs that are fixed versus variable.
- A company whose costs are mostly fixed has a high level of operating leverage.
- If a company has a high level of operating leverage, it means that much of any increase in revenue will fall straight to the bottom line in the form of profit, because the incremental cost of producing another unit is so low.
- For example, a swim club is a business that operates with a high level of operating leverage. Once the club is built and opened, its costs are relatively fixed. With the same number of staff, same size pool, same locker rooms, same maintenance expense, the club could go from 500 members to 510 members with little additional cost. Nearly 100% of the membership fees collected from the 10 new members would turn into profit.

SAMPLE ANSWER: *Operating leverage is the relationship between a company's fixed and variable costs. A company with more fixed costs has a higher level of operating leverage. While a company with a high degree of operating leverage will have a higher earnings growth potential than a company with a largely variable cost structure, certain financial institutions will prefer to lend to businesses with a variable cost structure to help mitigate their downside risk – the financial institution is comforted by the fact that the company they are lending to still has the ability to cut back on some of their expenses should they see an economic downturn approaching or other signs of a decrease in financial performance. Equity investors are the investors that benefit the most from earnings growth potential, and as such will prefer to invest in companies*

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with a higher degree of operating leverage.

HOW WOULD A $10 INCREASE IN DEPRECIATION IN YEAR 4 AFFECT THE DCF VALUATION OF A COMPANY?

SAMPLE ANSWER: *A $10 increase in depreciation decreases EBIT by $10, therefore reducing EBIT (1-T) by$10(1-T). Assuming a 40% tax rate, it drops EBIT (1-T) by $6, but you must add back the $10 depreciation in the calculation of Free Cash Flow. Therefore your FCF increases by $4 and your valuation will increase by the present value of that $4, (the equation for PV is below).*

$$PV\ of\ the\ \$4\ increase\ in\ year\ 4 = \frac{\$4}{(1+WACC)^4}$$

IF YOU HAVE TWO COMPANIES THAT ARE EXACTLY THE SAME IN REVENUE, GROWTH, RISK, ETC. BUT ONE IS PRIVATE AND ONE IS PUBLIC, WHICH COMPANY'S SHARES WOULD BE HIGHER PRICED?

- The public company most likely will be priced higher due to the liquidity premium one would pay to be able to buy and sell the shares quickly and easily in the public capital markets.
- Another reason the public shares should be priced higher would be the transparency required for the firm to be listed on a public exchange. Publicly traded companies are required to file audited financial statements, allowing investors to view them.

SAMPLE ANSWER: *The public company is likely to be priced higher for a couple of reasons. The main reason is the liquidity premium investors will pay for the ability to trade their stock quickly and easily on the public exchanges. A second reason is the sort of "transparency premium" that derives from the public company's requirement to make their audited financial documents public.*

WHAT COULD A COMPANY DO WITH EXCESS CASH ON ITS BALANCE SHEET?

- Many people would think that having excess cash on hand is not a bad thing. While it is good to

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have a cash buffer (especially in a time of economic turmoil), holding too much cash means you are giving up potential earnings from investing that cash elsewhere.

- A firm must be aware of its cash needs, and keep enough cash to cover itself in the event of a downturn
- A growing company will normally reinvest its cash in the operations of the business itself. This allows the company to expand and grow. This could be an investment in equipment, more employees, new offices, increased/upgraded marketing, etc.
- A company could also pay out the excess earnings as additional salary or bonuses to its employees or a dividend to its shareholders.
- An option to preserve some sense of liquidity would be investing in short-term CDs, allowing the firm to earn interest while locking up the investment for only a short time.
- Other options include investing in other companies, buying out a competitor, supplier or distributor, paying off debt, repurchasing stock, expanding to new markets, etc.

SAMPLE ANSWER: *Although it seems like having a lot of cash on hand might be a good thing, especially in a recession, it really isn't, because there is an opportunity cost to holding cash. A company should have enough cash to protect itself from bankruptcy in a downturn, but any excess cash should be put to work. The company could pay a dividend to its equity holders or bonuses to employees, although a growing company will tend to reinvest rather than pay out cash. It can reinvest its cash in plants, equipment, personnel, or marketing; it can pay off debt, repurchase equity, or buy out a competitor, supplier, or distributor. If nothing else, that cash can earn a little something invested in CDs until it can be put to better use.*

WHAT IS GOODWILL AND HOW DOES IT AFFECT NET INCOME?

- Goodwill is a line item in the assets section of a company's Balance Sheet.
- Goodwill can arise from an acquisition where the price paid for the firm being acquired is higher than the tangible assets being purchased. The difference between the price paid and the firm's book value would be accounted for in the "goodwill" section of the Balance Sheet.
- Goodwill represents intangible assets such as brand name, customer relationships, intellectual

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property, etc. Any Goodwill on a company's Balance Sheet is now tested annually for impairment under U.S. GAAP.

- If something happens that impairs the goodwill of the firm (such as a patent running out, an event hurting the brand, etc.), goodwill must be "written down" as an expense on the Income Statement.
- Impairment of goodwill affects net income in much the same way depreciation does. It is accounted for as an expense, just like depreciation is an expense, even though the company is not physically paying out cash to cover this expense.
- Goodwill is an intangible asset included on a company's Balance Sheet. Goodwill may include things like intellectual property rights, brand name, or customer relations. Goodwill is acquired when purchasing a firm if the acquirer pays more than the book value of its assets. When something occurs to diminish the value of the intangible assets, goodwill must be "written down" in a process much like that for depreciation. Goodwill is subtracted as a non-cash expense and therefore reduces net income.

WHAT ARE SOME EXAMPLES OF ITEMS THAT MAY NEED TO GET ADDED BACK TO EBITDA TO GET A BETTER SENSE FOR THE FINANCIAL HEALTH OF A COMPANY?

- Some examples are one-time, non-recurring items like legal expenses, one-time disaster payments or events, restructuring charges, debt/equity financing expenses, etc. Any items that are not likely to continue from one year to the next may be added back to EBITDA.

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How is CAPM Calculated?

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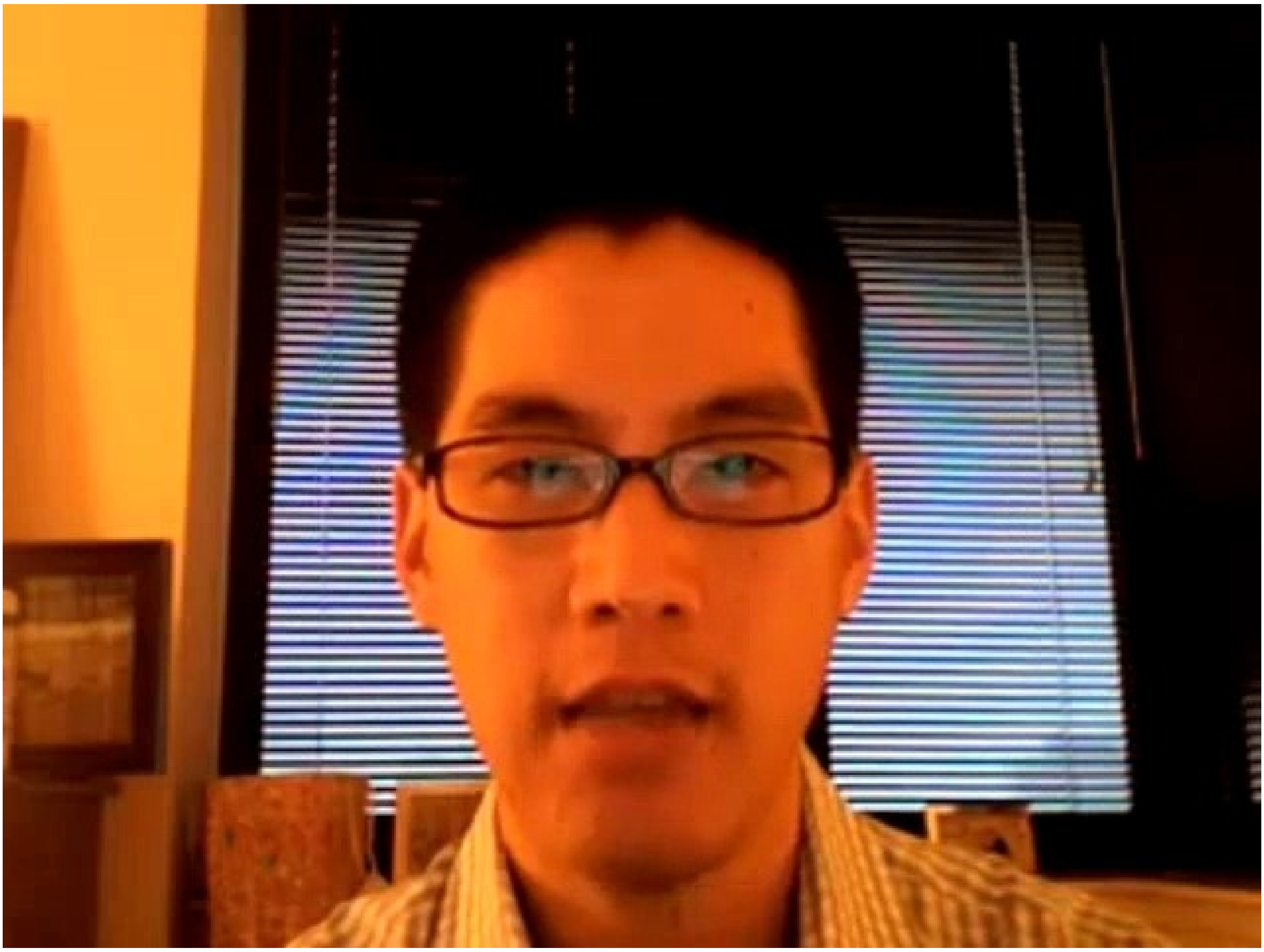
How do you Find and Unlever Beta?



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What Options Does a Company Have With Excess Cash on the Balance Sheet?

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Advanced Concepts, Questions and Case Studies

Advanced Concepts, Questions and Case Studies

WHEN BUILDING A MODEL, WHAT IS THE MOST COMMON WAY TO PROJECT ITEMS LIKE ACCOUNTS RECEIVABLE, ACCOUNTS PAYABLE, INVENTORY, DEPRECIATION, AND CAPITAL EXPENDITURES?

- Accounts receivable is normally projected as a percentage of revenues or using a ratio like Days Sales Outstanding.
- Accounts payable is normally projected as a percentage of cost of goods sold or using a ratio like Days Payable Outstanding.
- Inventory is normally projected as a percentage of cost of goods sold or using a ratio like Inventory Days.
- Depreciation can be calculated very simply using a percentage of the prior years' PP&E or can be calculated at the individual asset level using different schedules, useful lives, etc.
- Capex is normally projected as a percentage of revenues, or from company guidance you will have a relatively good idea of what capex requirements are going forward.

HOW/WHY DO YOU LEVER/UNLEVER BETA?

$$\beta_{unlevered} = \frac{\beta_{levered}}{[1 + (1 - T)\left(\frac{Debt}{Equity}\right)]} \qquad \beta_{levered} = \beta_{unlevered}[1 + \left((1 - T)\left(\frac{Debt}{Equity}\right)\right)]$$

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- The levered beta will be the beta you get from a website like Bloomberg or Google Finance.
- The exercise of calculating a WACC for a private company involves deriving beta from a group of publicly traded peer companies that may or may not have similar capital structures to one another or the target.
- To neutralize the effects of different capital structures, bankers typically unlever the beta for each company in the peer group to achieve the asset beta/unlevered beta. After calculating the beta for all companies in the comp set, the average unlevered beta is then re-levered using the company's target capital structure and marginal tax rate.

SAMPLE ANSWER: *By unlevering the beta, you remove the financial effects of debt in the capital structure. This unlevered beta shows you the risk of a firm's equity compared to the market. Comparing unlevered betas allows investors to see how much risk they will be taking by investing in a company's equity (i.e. buying stock in the public market). When you have a company that doesn't have a beta, Company A, you can find comparable Company B, take its levered beta, unlever it, and then re-lever it using Company A's target capital structure to come up with their beta.*

HOW WOULD YOU CALCULATE AN EQUITY BETA AND WHY IS IT IMPORTANT?

- Equity beta (also known as levered beta) offers a measure of how volatile a given stock's price movement is relative the overall market's movement. Equity beta accounts for the company's capital structure meaning that if the company has a levered capital structure, its stock will be more volatile than companies that have less debt within the capital structure.
- Equity beta compares to asset beta, which is a similar measure but ignores the impact of a company's capital structure. Essentially it is a measure of how volatile the underlying business is. This is important as it allows investors to find an optimal capital structure by finding the average asset beta of the industry and then re-lever it with the company's optimal capital structure with the following equation:
  - Asset Beta = Equity Beta / (1+(1-Tax Rate)*(Debt/Equity))

- In order to calculate an equity beta, you must perform a regression of the return of the stock

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versus the return of the market as a whole (the S&P 500). The slope of the regression line is the beta.

WHAT WOULD BE THE EFFECT OF USING LEVERED FREE CASH FLOW RATHER THAN UNLEVERED FREE CASH FLOW IN YOUR DCF MODEL?

SAMPLE ANSWER: *If you were to use the levered free cash flow in your DCF, you would end up with the Equity Value of the company rather than the Enterprise Value since the cash flows you are finding the present value for are after the debt investors had been repaid, therefore indicating how much cash would be available to equity investors, not to all investors.*

WHAT IS A DIVIDEND DISCOUNT MODEL?

- A dividend discount model is much like a DCF, but it will use dividends rather than free cash flow.
- Rather than projecting out free cash flow, you project out the earnings per share for the business.
- Assume that a certain percentage of EPS is being paid out as a dividend based on the historical dividend policy and how much cash the company wants to retain on its Balance Sheet.
- Project out the dividends for the next 5-10 years just as you would with free cash flow, and then discount them back and sum them like in a DCF, but rather than using WACC, you are going to use the cost of equity for the firm.
- For the terminal value, you will want to use an equity valuation multiple like P/E, and then discount that back to year 0, just as you would do in a DCF.
- The sum of the PV's of all the dividends is the per share value of the company.

WHAT'S THE DIFFERENCE BETWEEN CASH-BASED ACCOUNTING AND ACCRUAL ACCOUNTING?

- **CASH BASED ACCOUNTING:** This form of accounting recognizes revenues and expenses as of the time cash is actually collected or disbursed. For example, if a company receives a payment on a credit card, it wouldn't be recorded as revenue until the credit card company actually deposits

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the money into the company's bank account.

- **ACCRUAL ACCOUNTING:** With accrual accounting, as soon as the company makes a payment or sale and believes it will pay for or be paid for a good or service, it will recognize the expense or revenue. Using the prior example, if the company is using accrual accounting, they will book the revenue as soon as they are paid, and it will show up as an accounts receivable on the Balance Sheet until the money is actually deposited into their account, at which time the accounts receivable balance will go down and the cash balance will go up.

SAMPLE ANSWER: *With cash-based accounting, a company won't recognize expenses or revenues until the cash is actually disbursed or collected. With accrual accounting, a company will recognize expenses and revenues when it has entered into a transaction or agreement that will require it to pay or be paid, even if cash won't change hands until sometime in the future. Most companies use accrual accounting since credit cards are so prevalent.*

WHAT ARE SOME DIFFERENCES BETWEEN TAX ACCOUNTING AND GAAP ACCOUNTING?

- Since tax accounting is used to calculate just what income tax a company owes in a year, it is focused on just the revenues and expenses for a given year and is cash based. GAAP accounting is more concerned with tracking a company long term, so it tracks assets and liabilities as well and is accrual based.
- Another difference includes different the depreciation schedules: accelerated for tax accounting and straight line for GAAP accounting.

WHAT IS THE DIFFERENCE BETWEEN LIFO AND FIFO?

- LIFO and FIFO are different ways of keeping track of inventory value and cost of goods sold.

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- **LIFO (LAST IN FIRST OUT):** With the LIFO accounting policy, a company assigns the value of the most recently purchased/produced goods to the first sale. For example, if a company built 5 widgets for $5 and then built 5 widgets for $10, the value of their inventory would be $75. The first 5 widgets they sell will have a $10 COGS and will reduce inventory by $10 each, and the last 5 widgets will have a $5 COGS and will reduce inventory by $5 each.

- **FIFO (FIRST IN FIRST OUT):** With the FIFO accounting policy, a company assigns to the first sale the value of goods built or purchased first. For example, if a company built 5 widgets for $5 and then built 5 widgets for $10, the value of their inventory would be $75. The first 5 widgets they sell will have a $5 COGS and will reduce inventory by $5 each, and the last 5 widgets will have a $10 COGS and will reduce inventory by $10 each.

SAMPLE ANSWER: *LIFO and FIFO are different methods of dealing with inventory and COGS in a company's accounting policy. With LIFO, the last inventory produced or purchased will be the first to be recognized when goods are sold. With FIFO, the first inventory produced or purchased will be the first recognized when goods are sold. Individual pieces of inventory will have different carrying values on the Balance Sheet depending on whether or not they are being valued using LIFO or FIFO.*

WHAT IS THE MID-YEAR CONVENTION IN A DCF?

- To account for the fact that cash is collected equally over the course of the year, you discount back using "half-years" as if the cash were all collected in the middle of the year.

- The mid-year convention is used because the cash flows in a business are not all received at the end of a year.

- To account for the fact that cash is collected throughout the year, you discount back using "half-years" in order to assume the cash is all collected in the middle of the year.

	Year 1	Year 2	Year 3	Year 4	Year 5
Normal	1.0	2.0	3.0	4.0	5.0
Mid-Year	0.5	1.5	2.5	3.5	4.5

SAMPLE ANSWER: *Since cash is not collected all at once at the end of the year, one can account for that by discounting the cash flows at a slightly lower rate. In order to execute this, one will discount using "half-*

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years," which assumes that all the cash is collected in the middle of the year, which is a more reasonable assumption than 100% of collections on December 31st. For example, the 4th year's cash flow number would be discounted using 3.5 years to assume the cash is collected midway between the end of year 3 and the end of year 4.

HOW DO YOU GO FROM THE ENTERPRISE VALUE YOU WOULD CALCULATE USING A DCF TO A PER SHARE PRICE FOR A PUBLIC COMPANY?

SAMPLE ANSWER: *Once you come up with your Enterprise Value, you add cash and then subtract debt, preferred stock, and minority interest to come up with an Equity Value. Once you have the Equity Value, you must use Excel to calculate a per share price based on the number of fully diluted shares outstanding. However, the number of fully diluted shares will depend on the share price, so you will have to use the iterations function in Excel in order calculate this.*

WALK ME THROUGH THE IPO PROCESS FOR A COMPANY THAT IS BEING TAKEN PUBLIC.

- When valuing a company for an IPO, the investment bank leading the deal will price the company primarily on publicly traded comparable companies.
- Once the banking team has identified a strong comps set, they will perform a comparable companies' analysis.
- You can't go into a tremendous amount of detail here because there is just so much that goes into this process. Focus on hitting the main, high-level steps and you will be just fine.

SAMPLE ANSWER: *The purpose of an IPO is to issue the least number of shares possible for the highest price per share, therefore raising the most money for the lowest possible ownership percentage of the company. You do this by selling shares of the company at an attractive valuation and recruiting institutional investors (hedge funds, mutual funds, etc.) to support the client's share price once the company lists its stock on the public exchange. First, you will meet with the client to gather information like historical financials, industry information, customer data, company overview, etc. Then you will meet with lawyers to draft the company's registration documents (called an S-1 in the US), which details the business, its operations, its customers, its financials, etc. to potential investors. This goes through many revisions working with the lawyers and the SEC until all parties accept it. The bankers then take the client on a "road show" where the company is presented to institutional investors in different cities around the country (or globe). After the roadshow, and after the company has raised the capital from the institutional investors the shares of the stock will begin trading on one of the public exchanges.*

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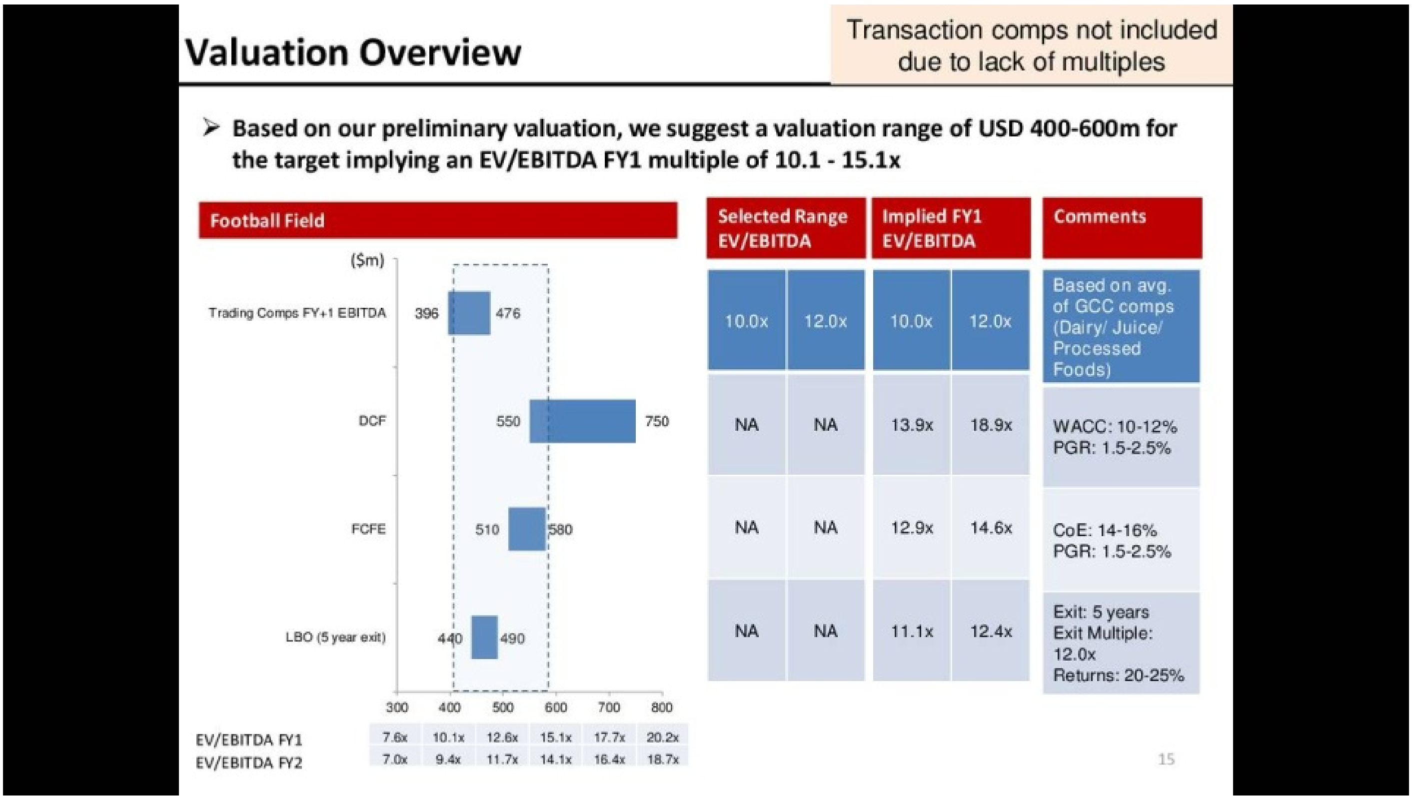

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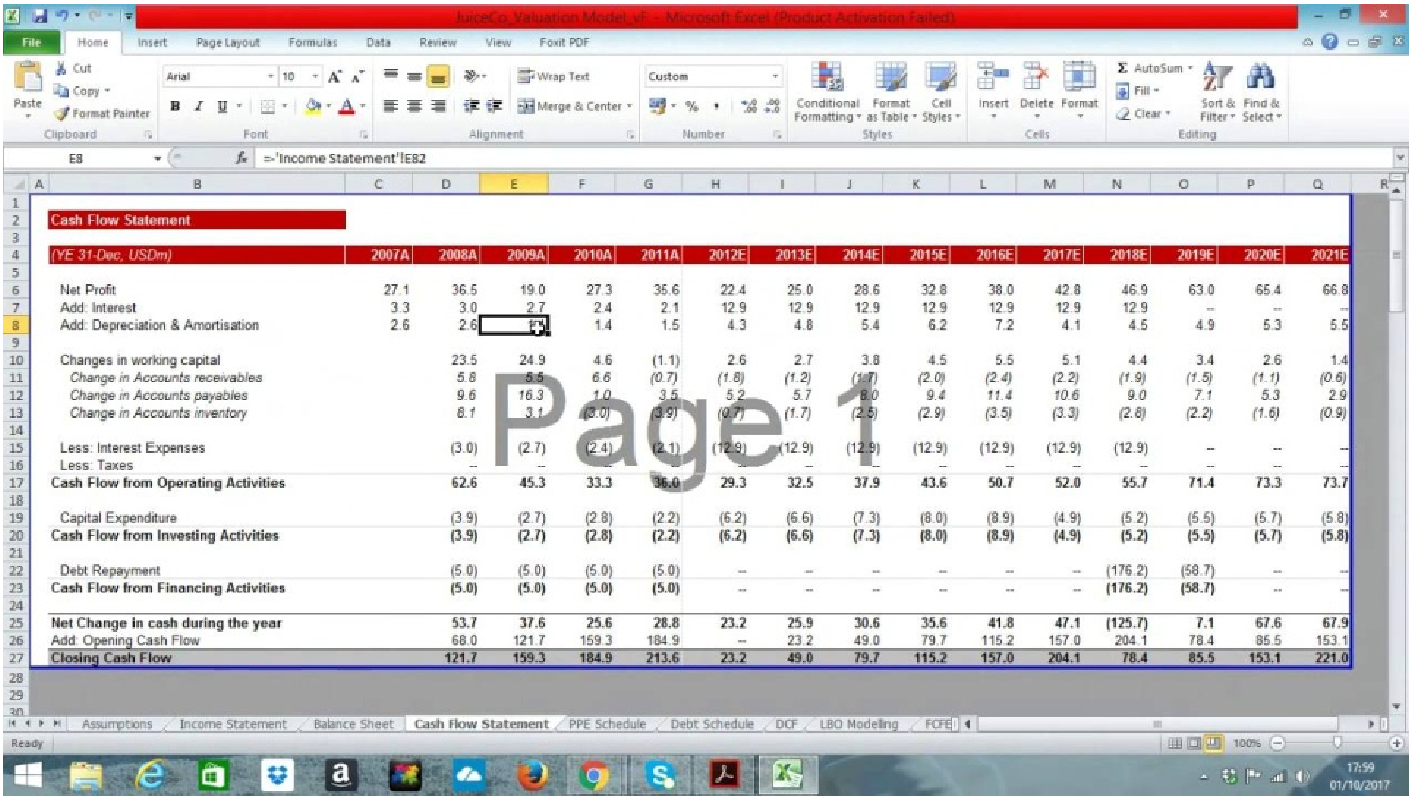

Cash Flow Statement

(YE 31-Dec, USDm)	2007A	2008A	2009A	2010A	2011A	2012E	2013E	2014E
Net Profit	27.1	36.5	19.0	27.3	35.6	22.4	25.0	28.6
Add: Interest	3.3	3.0	2.7	2.4	2.1	12.9	12.9	12.9
Add: Depreciation & Amortisation	2.6	2.6	[illegible]	1.4	1.5	4.3	4.8	5.4
Changes in working capital		23.5	24.9	4.6	(1.1)	2.6	2.7	3.8
Change in Accounts receivables		*5.8*	*5.5*	*6.6*	*(0.7)*	*(1.8)*	*(1.2)*	*(1.7)*
Change in Accounts payables		*9.6*	*16.3*	*1.0*	*3.5*	*5.2*	*5.7*	*8.0*
Change in Accounts inventory		*8.1*	*3.1*	*(3.0)*	*(3.9)*	*(0.7)*	*(1.7)*	*(2.5)*
Less: Interest Expenses		(3.0)	(2.7)	(2.4)	(2.1)	(12.9)	(12.9)	(12.9)
Less: Taxes		--	--	--	--	--	--	--
Cash Flow from Operating Activities		**62.6**	**45.3**	**33.3**	**36.0**	**29.3**	**32.5**	**37.9**
Capital Expenditure		(3.9)	(2.7)	(2.8)	(2.2)	(6.2)	(6.6)	(7.3)
Cash Flow from Investing Activities		**(3.9)**	**(2.7)**	**(2.8)**	**(2.2)**	**(6.2)**	**(6.6)**	**(7.3)**
Debt Repayment		(5.0)	(5.0)	(5.0)	(5.0)	--	--	--
Cash Flow from Financing Activities		**(5.0)**	**(5.0)**	**(5.0)**	**(5.0)**	--	--	--
Net Change in cash during the year		**53.7**	**37.6**	**25.6**	**28.8**	**23.2**	**25.9**	**30.6**
Add: Opening Cash Flow		68.0	121.7	159.3	184.9	--	23.2	49.0
Closing Cash Flow		**121.7**	**159.3**	**184.9**	**213.6**	**23.2**	**49.0**	**79.7**

(YE 31-Dec, USDm)	2015E	2016E	2017E	2018E	2019E	2020E	2021E
Net Profit	32.8	38.0	42.8	46.9	63.0	65.4	66.8
Add: Interest	12.9	12.9	12.9	12.9	--	--	--
Add: Depreciation & Amortisation	6.2	7.2	4.1	4.5	4.9	5.3	5.5
Changes in working capital	4.5	5.5	5.1	4.4	3.4	2.6	1.4
Change in Accounts receivables	*(2.0)*	*(2.4)*	*(2.2)*	*(1.9)*	*(1.5)*	*(1.1)*	*(0.6)*
Change in Accounts payables	*9.4*	*11.4*	*10.6*	*9.0*	*7.1*	*5.3*	*2.9*
Change in Accounts inventory	*(2.9)*	*(3.5)*	*(3.3)*	*(2.8)*	*(2.2)*	*(1.6)*	*(0.9)*
Less: Interest Expenses	(12.9)	(12.9)	(12.9)	(12.9)	--	--	--
Less: Taxes	--	--	--	--	--	--	--
Cash Flow from Operating Activities	**43.6**	**50.7**	**52.0**	**55.7**	**71.4**	**73.3**	**73.7**
Capital Expenditure	(8.0)	(8.9)	(4.9)	(5.2)	(5.5)	(5.7)	(5.8)
Cash Flow from Investing Activities	**(8.0)**	**(8.9)**	**(4.9)**	**(5.2)**	**(5.5)**	**(5.7)**	**(5.8)**
Debt Repayment	--	--	--	(176.2)	(58.7)	--	--
Cash Flow from Financing Activities	--	--	--	**(176.2)**	**(58.7)**	--	--
Net Change in cash during the year	**35.6**	**41.8**	**47.1**	**(125.7)**	**7.1**	**67.6**	**67.9**
Add: Opening Cash Flow	79.7	115.2	157.0	204.1	78.4	85.5	153.1
Closing Cash Flow	**115.2**	**157.0**	**204.1**	**78.4**	**85.5**	**153.1**	**221.0**

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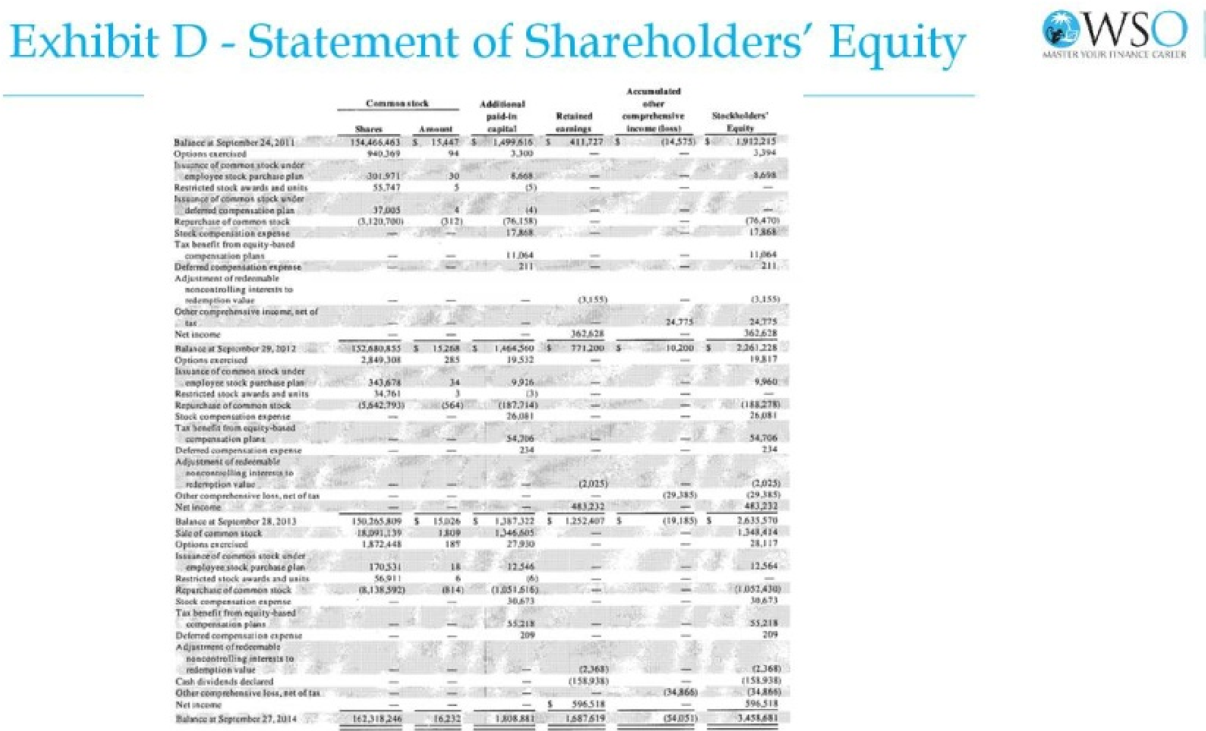

Exhibit D - Statement of Shareholders' Equity

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	Common stock Shares	Common stock Amount	Additional paid-in capital	Retained earnings	Accumulated other comprehensive income (loss)	Stockholders' Equity
Balance at September 24, 2011	154,466,463	$ 15,447	$ 1,499,816	$ 411,727	$ (14,575)	$ 1,912,215
Options exercised	940,369	94	3,300	—	—	3,394
Issuance of common stock under employee stock purchase plan	301,971	30	8,668	—	—	8,698
Restricted stock awards and units	55,747	5	(5)	—	—	—
Issuance of common stock under deferred compensation plan	37,005	4	(4)	—	—	—
Repurchase of common stock	(3,120,700)	(312)	(76,158)	—	—	(76,470)
Stock compensation expense	—	—	17,868	—	—	17,868
Tax benefit from equity-based compensation plans	—	—	11,064	—	—	11,064
Deferred compensation expense	—	—	211	—	—	211
Adjustment of redeemable noncontrolling interests to redemption value	—	—	—	(3,155)	—	(3,155)
Other comprehensive income, net of tax	—	—	—	—	24,775	24,775
Net income	—	—	—	362,628	—	362,628
Balance at September 29, 2012	152,680,855	$ 15,268	$ 1,464,560	$ 771,200	$ 10,200	$ 2,261,228
Options exercised	2,849,308	285	19,532	—	—	19,817
Issuance of common stock under employee stock purchase plan	343,678	34	9,926	—	—	9,960
Restricted stock awards and units	34,761	3	(3)	—	—	—
Repurchase of common stock	(5,642,793)	(564)	(187,714)	—	—	(188,278)
Stock compensation expense	—	—	26,081	—	—	26,081
Tax benefit from equity-based compensation plans	—	—	54,706	—	—	54,706
Deferred compensation expense	—	—	234	—	—	234
Adjustment of redeemable noncontrolling interests to redemption value	—	—	—	(2,025)	—	(2,025)
Other comprehensive loss, net of tax	—	—	—	—	(29,385)	(29,385)
Net income	—	—	—	483,232	—	483,232
Balance at September 28, 2013	150,265,809	$ 15,026	$ 1,387,322	$ 1,252,407	$ (19,185)	$ 2,635,570
Sale of common stock	18,091,139	1,809	1,346,605	—	—	1,348,414
Options exercised	1,872,448	187	27,930	—	—	28,117
Issuance of common stock under employee stock purchase plan	170,531	18	12,546	—	—	12,564
Restricted stock awards and units	56,911	6	(6)	—	—	—
Repurchase of common stock	(8,138,592)	(814)	(1,051,616)	—	—	(1,052,430)
Stock compensation expense	—	—	30,673	—	—	30,673
Tax benefit from equity-based compensation plans	—	—	55,218	—	—	55,218
Deferred compensation expense	—	—	209	—	—	209
Adjustment of redeemable noncontrolling interests to redemption value	—	—	—	(2,368)	—	(2,368)
Cash dividends declared	—	—	—	(158,938)	—	(158,938)
Other comprehensive loss, net of tax	—	—	—	—	(34,866)	(34,866)
Net income	—	—	—	$ 596,518	—	596,518
Balance at September 27, 2014	162,318,246	16,232	1,808,881	1,687,619	(54,051)	3,458,681

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Basic Concepts, Questions, and Case Studies

Basic Concepts, Questions, and Case Studies

NAME THREE STOCKS/COMPANIES THAT YOU THINK ARE UNDERVALUED AND EXPLAIN WHY YOU CHOSE THEM.

- This question is unique to you and is particularly common in Sales and Trading interviews.
- Do some research and find a few stocks you believe are good buys at the current market price. You must have a good reason behind each of your picks.
- The best way to find these stocks is to use equity research reports if you can. Many schools will have access to them through their library website. You also can use sites like Jim Cramer's TheStreet. com or Motleyfool.com to look at articles about others' stock picks and the reasons behind them. WallStreetOasis.com is a good place to find stock ideas.
- If you are feeling ambitious, you could go through the process of valuing the stocks yourself, using any of the valuation techniques.
- Generally speaking, we have found you are better off picking a less well known company, so your interviewers have less ability to cross-examine you on your reasoning. If they know a stock well, they will be able to test you and push you on specifics about it. Go with this strategy unless you learn that you are interviewing or applying for a position in a specific industry, then you may be compelled by the interviewer to focus on a relevant sector.
- Variations of this question include "Pitch me a stock" or "What stocks would you short right now?" (The "Short" answer would be opposite to the "Pitch" answer, in that you would short a

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stock you believe will perform poorly.)

WHAT DID THE S&P 500/DOW JONES INDUSTRIAL AVERAGE/NASDAQ CLOSE AT YESTERDAY?

- This question is used to gauge your general interest in the financial markets. You probably will not be expected to know the number to the penny, but knowing the levels of the three major exchanges/indices, as well as whether they were up or down and why, will show your interviewer that you keep track of what is going on in the world of finance.
- You should know how the market moved (up or down) the previous day and why it moved. You can find this information by watching CNBC, reading the WSJ, etc.
- Yesterday the XXXX closed at XXXX, up/down XXX from the open. I also noticed that it was up XXX from the day before due to ....
- It would also be a good demonstration of market interest to know the overall valuation levels of the three major indices. The P/E ratios for the overall Dow, S&P 500, and Nasdaq is publicly available on major financial news publications.

COMPANY XYZ RELEASED INCREASED QUARTERLY EARNINGS YESTERDAY, BUT THEIR STOCK PRICE STILL DROPPED. WHY?

SAMPLE ANSWER: *There are two main reasons that this could occur. First, the entire market or the industry to which XYZ belongs could have been down on the day, which had more of an impact than the company's positive earnings. More likely, however, is that the increased earnings figures they reported were not as high as the Wall Street analysts' estimates.*

WHAT DOES IT MEAN TO SHORT A STOCK?

- Short selling is selling a stock that you don't actually own.
- Investors that short-sell a stock believe they will be able to purchase that stock at a lower price in the future.
- Typically, a short-seller will borrow the stock from another investor, and then sell it, promising to

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return the stock to the lender at a later date. Brokerage firms are able to facilitate this borrowing; however, not all stocks can be shorted.

- “Naked” short selling occurs when an investor sells the stock without actually having borrowed any.

SAMPLE ANSWER: *Short selling a stock is the opposite of going long in a stock. Usually an investor buys a stock believing it will sell for a higher price in the future. When short-selling, investors stock they don’t actually own, in the belief that they will be able to purchase it for a lower price in the future.*

WHAT IS LIQUIDITY?

- Liquidity is how freely an asset or security can be bought and sold on the open markets.
  - Money market accounts, publicly traded large cap stocks and bonds, ETF’s, and open-ended mutual funds are very liquid.
  - Micro-cap stocks, bonds, loans, or investments in privately-owned companies could be considered relatively illiquid due to the limited market for them.

- Liquidity also describes how quickly an asset can be converted into cash.
  - Cash itself is the most liquid asset.
  - A large pharmaceutical production plant is not a very liquid asset because it would take the owner of the plant a long time to sell the plant and convert it into usable cash.

- A more liquid investment is relatively safer, all else equal, since the investor can sell it at any time.

SAMPLE ANSWER: *Liquidity is how easily an asset can be bought and sold by an investor. Some examples of liquid assets include money market accounts and large-cap stocks. Some non-liquid assets include many micro-cap stocks, or a large, specialized factory or production plant that could take years to convert into cash.*

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IS 15 A HIGH P/E (PRICE TO EARNINGS) RATIO?

- This is not a yes or no question. A firm's P/E ratio is important in comparison with other companies in its industry. P/E can be thought of as how many dollars an investor is willing to pay for one dollar of earnings. A high P/E represents high anticipated growth in earnings. In high growth industries, such as technology, a P/E ratio of 15 may be considered relatively low, since the company is expected to grow its earnings at a high rate, and therefore deserves a higher valuation relative to current earnings. For a large pharmaceutical company, however, a P/E of 15 may be considered high, since earnings growth may be expected to be slow but steady in future years.

SAMPLE ANSWER: It depends on the industry. A P/E ratio of 15 in an industry like basic materials may be considered a bit high, but if the company is a high-growth tech company, 15 may be considered rather low.

WHAT DO BANKERS DO DURING AN INITIAL PUBLIC OFFERING (IPO)?

- You can't go into a tremendous amount of detail here because there is just so much that goes into this process. Focus on hitting the main, high-level steps and you will be just fine.

SAMPLE ANSWER: *The purpose of an IPO is to issue the least number of shares possible for the highest price per share, therefore raising the most money for the lowest possible ownership percentage of the company. You do this by selling shares of the company at an attractive valuation and recruiting institutional investors (hedge funds, mutual funds, etc.) to support the client's share price once the company lists its stock on the public exchange. First, you will meet with the client to gather information like historical financials, industry information, customer data, company overview, etc. Then you will meet with lawyers to draft the company's registration documents (called an S-1 in the US), which details the business, its operations, its customers, its financials, etc. to potential investors. This goes through many revisions working with the lawyers and the SEC until all parties accept it. The bankers then take the client on a "road show" where the company is presented to institutional investors in different cities around the country (or globe). After the roadshow, and after the company has raised the capital from the institutional investors the shares of the stock will begin trading on one of the public exchanges.*

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[Intermediate Concepts, Questions, and Case Studies]

Intermediate Concepts, Questions, and Case Studies

WHERE DO YOU THINK THE STOCK MARKET WILL BE IN 3/6/12 MONTHS?

- This is another question that can show your interest in the markets. There is no right or wrong answer since everyone has different opinions on where the market is going.
- You need to have an opinion and well thought out reasoning for that opinion.
- If you think the market is going to drop in the next three months, hit a bottom, and then begin to bounce back, have a reason to explain why you think it is going to drop, why it is going to bottom out, and why it will begin to rise.
- It is more important to display logical reasoning than to be right.
- Do some research before your interview; see what writers for major newspapers are saying and predicting, and then use some of their reasons in your explanation.
- Also, stick to your reasoning. Your interviewer may challenge you and question your reasoning. If you have come up with solid theory behind your response, be confident in your answer and try to explain your rationale. If your logic makes sense, don't change your opinion just to agree with your interviewer.

HOW DO YOU VALUE A COMPANY DIFFERNETLY IN AN IPO THAN IN AN M&A DEAL?

- The main difference is that you focus on the forward multiples of the Public Comps because

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investors pay so much attention to them when a company goes public. A company's pricing in an IPO is based on these metrics as well. So, if the median 1-year forward P / E multiple for similar public companies is 20x, you might suggest a range of 1-year forward P / E multiples around 20x for your company as well.

SAMPLE FOLLOW UP QUESTION: How do you build an IPO model for a company?

SAMPLE FOLLOW UP ANSWER: *You start by assuming a range of forward multiples (often P / E multiples) and then applying them to the company's projected financial metrics. If you're using P / E multiples, that gets you the company's implied post-money Equity Value when it starts trading. But companies almost always offer new investors a* ***pricing discount*** *in IPOs, so you have to apply that discount (10-15%) to determine the post-money Equity Value at pricing. Then, you can determine the Offering Price per Share by taking the post-money Equity Value at pricing, subtracting the offering size, and dividing by the company's pre-IPO share count. Based on that, you can calculate the Primary Shares issued in the offering. For example, a post-money Equity Value of $10 billion / $50.00 Offering Price = 200 million shares, and if the company currently has 150 million shares, it must issue 50 million new ones. You can then determine the Secondary Shares and Overallotment Shares based on separate assumptions for those. Finally, you calculate the % of the company sold in the IPO and its valuation multiples at pricing and trading, reflecting the Net IPO Proceeds in its Equity Value and Enterprise Value.*

WHY DO COMPANIES OFFER PRICING DISCOUNTS IN IPOS?

- Even if a company believes its shares are worth $100.00, it usually lets new investors in an IPO purchase them at a discount of ~15% (so, $85.00 here) because those investors assume significant risk by purchasing the shares before the company is a publicly traded entity. Anything could happen between pricing and the first few minutes of trading – the company's share price might plunge by 20%, for example. To compensate investors for that risk, companies offer this discount.

HOW DOES A COMPANY DECIDE ON THE AMOUNT OF CAPITAL TO RAISE IN AN IPO?

- It depends on the reason why the company is going public: If it needs capital for a specific purpose, Technical Interview Guide - Preparation for Finance Interviews such as making an acquisition, paying down debt, or buying a factory, it will aim to raise that amount of capital.

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- But if the company is going public to provide existing investors with an exit and liquidity, it often raises capital such that it sells a certain percentage of the company (often between 20% and 40%).
- The company wants to offer enough new shares to make investors committed to the company, but not so many that it gives up control. Some companies can get around these guidelines if they're "hot," and there's a huge amount of demand for their shares – they can often sell much smaller percentages of their equity, such as 5-10%, in initial public offerings.

WHAT IS THE SIGNIFICANT OF PRIMARY VS. SECONDARY SHARES IN AN IPO OR FOLLOW-ON?

- A primary offering occurs when new shares are issued by the company in an equity offering. They dilute the company's existing investors by reducing their ownership stake, but they also allow the company to raise capital. Secondary shares are existing shares sold to new investors in the offering. They do not dilute existing investors at all, but the company also receives no cash from them.
- The percentages of primary and secondary shares should be within reasonable ranges in an equity offering, or the market may not buy into it. For example, new investors may be skeptical if too many existing investors want to sell their shares.

SAMPLE FOLLOW UP QUESTION: How might the market interpret an IPO with 100% secondary shares?

SAMPLE FOLLOW UP ANSWER: *The market would typically interpret this deal negatively since the company is not issuing any new shares, which implies that growth expectations are low. Also, if so many existing investors sell their shares in the company, they're sending a signal to the market that they don't believe in the company's long-term prospects. In most market environments, it would be difficult-to-impossible to conduct an IPO with no primary shares. Interestingly, one of the hottest public company offerings in 2018 was the IPO of music streaming service Spotify, which was a 100% secondary share offering, providing a liquidity solution to existing investors. The public equity markets received the offering well, as the price stabilized in its IPO range. This was the first successful IPO that was a 100% secondary share offering in quite a while.*

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CAN YOU TELL ME ABOUT A RECENT IPO YOU HAVE FOLLOWED?

- Again, this is a question you need to research around the time of your interview. You can find an IPO discussed in the Wall Street Journal or Financial Times. Another option is to go to dealbook.blogs. nytimes.com and click on the IPO/Offerings tab to see what recent IPOs have occurred. Know what company went public, a little information about the company, what the offer price was, which banks completed the IPO, etc. Many of these news services have daily newsletters, which will detail the list of public offerings each day the market is open.

IF YOU READ THAT A CERTAIN MUTUAL FUND ACHIEVED 50% RETURNS LAST YEAR, WOULD YOU INVEST IN IT?

- Past performance is not an indication of future results. This is the disclaimer you hear at the end of nearly every commercial that presents a fund's past performance as a selling point. The reason for this is because a specific investment type could perform remarkably well one year and then significantly under perform in the following year.

SAMPLE ANSWER: *To make an investment decision you need to research more in depth into the fund's holdings, management, fee structure, etc., because past performance—especially a single year—is not an indicator of future results. A mutual fund full of mortgage backed securities could have been up 50% a few years ago and then been down 90% the year after the market for MBSs collapsed.*

IF A COMPANY'S STOCK HAS GONE UP 20% IN THE LAST 12 MONTHS, IS THE COMPANY'S STOCK IN FACT DOING WELL?

SAMPLE ANSWER: *The answer to that question depends on a number of factors including the company's beta and the market's performance. If the stock's beta is 1 (meaning it should be as volatile as the market and therefore produce market returns) and the market was up 30% over the past 12 months, then the stock is doing relatively poorly.*

WHAT IS INSIDER TRADING AND WHY IS IT ILLEGAL?

- Insider trading is buying or selling public securities based on information that is not available to the public.
- Examples include an investment banker buying or selling the stock of a company before an M&A

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deal is announced or a CEO buying or selling his/her company's stock prior to making a major announcement.

SAMPLE ANSWER: *Insider trading is buying or selling stock based on information that is not publicly available. For example, if a CEO of a pharmaceutical company knows that one of his or her company's drugs is going to be pulled from the shelves by the FDA, that CEO cannot sell his or her stock until the information has been released to the public.*

WHO IS A MORE SENIOR CREDITOR, A BONDHOLDER OR STOCKHOLDER?

SAMPLE ANSWER: *A bondholder is always senior to a stockholder. In the event of bankruptcy/liquidation, the bondholder will be repaid first. Additionally, interest payments are paid to bondholders before equity holders receive any profits in the form of dividends.*

HOW CAN A COMPANY RAISE ITS STOCK PRICE?

- A company can repurchase stock, which lowers the number of shares outstanding and therefore increases the value per share.
- It can improve operations to produce higher earnings, causing its EPS to be higher than anticipated by industry analysts, which will send a positive signal to the market.
- It can announce a change to its organizational structure such as cost-cutting or consolidation, which would lead to increased earnings.
- It could announce the institution of a dividend policy or an increase in an existing dividend.
- It can announce an accretive merger or an acquisition that will increase earnings per share.

SAMPLE ANSWER: *Any positive news about the company can potentially raise the stock price. If the company repurchases stock, it lowers the shares outstanding and raises the EPS, which would raise the stock price. A repurchase is also seen as a positive signal in the market. A company could announce operational efficiencies or other cost-cuts, or a change to its organizational structure such as consolidations. It could announce an accretive merger or acquisition that would increase earnings per share. Any of these occurrences would most likely raise the company's stock price.*

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A STOCK IS TRADING AT $5 AND ANOTHER STOCK IS TRADING AT $50. WHICH HAS GREATER GROWTH POTENTIAL?

- It depends. The stock with the higher growth potential is most likely the stock with the lower market cap, so if the $5 stock has 1 billion shares outstanding and the $50 stock has 10,000 shares outstanding, the $50 stock would most likely have higher growth potential.

IF YOU BOUGHT A STOCK X A YEAR AGO FOR $10, SOLD IT TODAY FOR $15, AND RECEIVED $5 IN DIVIDENDS OVER THE YEAR, WHAT WOULD YOUR OVERALL RETURN BE?

- Return on Stock = $\frac{\textit{Sale Price}+\textit{Dividends}-\textit{Purchase Price}}{\textit{Purchase Price}}$
- So... Return on Stock X = $\frac{\$15+\$5-\$10}{\$10} = 100\%$
- Return on a stock is its sale price plus dividends paid minus its purchase price, as a percentage of the purchase price. For stock X, that would be 15 plus 5 minus 10, which is 10, or 100% return on my investment.

WHAT IS CORRELATION?

- Correlation is how two stocks move in relation to each other.
- If two stocks have a strong positive correlation, they move up or down together.
- If two stocks have a strong negative correlation, when one moves up, the other should move down, and vice versa.
- Correlation ranges between –1 and 1.

SAMPLE ANSWER: *Correlation is the way that two investments move in relation to one another. If two investments have a strong positive correlation, they will have a correlation near 1 and when one goes up or down, the other will do the same. When you have two with a strong negative correlation, they will have a correlation near -1 and when one investment moves up in value, the other should move down.*

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Correlation of -1	Correlation of 0	Correlation of 1
Strong Negative Correlation	No Correlation	Strong Positive Correlation
When one investment goes up in value, the other goes down	Investments move independently	When one investment goes up in value, the other goes up
Example: Oil prices and Airline Stocks	Example: A large railway and a small software company	Example: Two high end hotel chains

WHAT IS DIVERSIFICATION?

- Diversification is mixing a wide variety of investments in your portfolio in search of a better risk/return ratio than putting all your capital into only one or a few investments.
- To diversify your portfolio you may want to pick investments that have a low correlation. When economic conditions push one investment to have a good period, the other may be having its down period and vice versa.
- Systematic risk is the risk that affects the entire market while unsystematic risk affects only specific industries. If properly diversified, investors can essentially eliminate all unsystematic risk from their portfolios.

SAMPLE ANSWER: *Diversification is creating a portfolio of different types of investments. It means investing in stocks, bonds, alternative investments, etc. It also means investing across different industries. If investors are properly diversified, they can essentially eliminate all unsystematic risk from their portfolios, meaning that they can limit the risk associated with individual stocks so that their portfolios will be affected only by factors affecting the entire market.*

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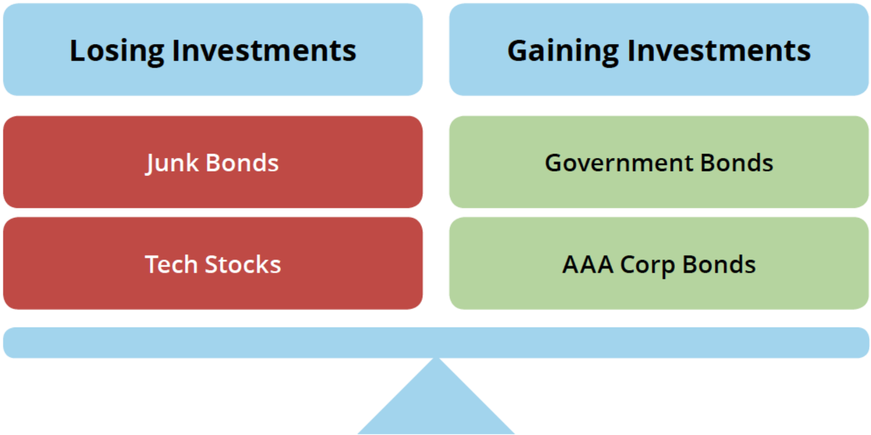

IF YOU ADD A RISKY STOCK TO A PORTFOLIO, WHAT HAPPENS TO THE OVERALL RISK OF YOUR PORTFOLIO?

SAMPLE ANSWER: *It depends on the correlation between the new investment and the rest of the portfolio. It could lower the overall risk of the portfolio if the new stock has a negative correlation compared to the rest of the portfolio.*

WHAT IS THE DIFFERENCE BETWEEN TECHNICAL ANALYSIS AND FUNDAMENTAL ANALYSIS?

SAMPLE ANSWER: *Technical analysis is the process of picking stocks based on quantitative, statistical analyses, historical trends and stock movements. Fundamental analysis is examining a company's fundamentals, financial statements, industry, etc., and then picking stocks that are "undervalued."*

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How Do You Calculate EPS? Why is it Important?

Watch video at https://www.wallstreetoasis.com/courses/technical-interview-course/module-3-stocks/how-do-you-calculate-eps-why-is-it-important

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[Advanced Concepts, Questions, and Case Studies]

Advanced Concepts, Questions, and Case Studies

WHAT DO YOU THINK IS GOING ON WITH XYZ COMPANY/INDUSTRY?

- This is another question to gauge your general interest in the financial markets.
- You cannot prepare for this question in any other way than to keep up with reading the Wall Street Journal, Financial Times, and/or The Economist, and/or watching CNBC.
- Chances are your interviewer will ask you about a company or industry that has been in the news recently or about something that you have shown interest in on your resume, rather than picking a completely arbitrary company or industry.

WHEN SHOULD A COMPANY BUY BACK STOCK?

SAMPLE ANSWER: *A company should buy back its own stock if it believes the stock is undervalued, when it has extra cash, if it believes it can make money by investing in itself, or if it wants to increase its stock price by increasing its EPS by reducing shares outstanding or sending a positive signal to the market.*

WHY DO SOME STOCKS RISE SO MUCH ON THE FIRST DAY OF TRADING AFTER THEIR IPO AND OTHERS DON'T? HOW IS THAT "MONEY LEFT ON THE TABLE"?

- Groupon is great example of a stock that gained over 50% during its first day of trading in 2011. The stock had an IPO price of $20 per share and rose to over $31 per share. As of October 2012,

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the stock has traded down below $5 per share.

- Money left on the table means the company could have completed the offering at a higher price, and that difference in valuation goes to the initial investors in the stock, rather than to the company raising the money. This means the company could have sold the same stock in its IPO at a higher price than it actually did. This happened a lot during the dot-com boom. Companies' stock would skyrocket on the first day of trading due to the huge hype over the stock.

WHAT IS THE IMPACT OF A GREENSHOE PROVISION IN AN IPO OR FOLLOW-ON, AND WHEN MIGHT AN INVESTMENT BANK AND COMPANY OFFER IT?

- A "Greenshoe" lets a company sell more shares than originally planned in an Equity offering. A company might use it if there's higher-than-expected demand for its shares, and it believes it can raise additional capital easily, without completing a separate offering. For example, the company initially planned to offer 10 million shares at $10.00 each, but with a 15% Greenshoe, it can offer 11.5 million shares and raise $115 million instead of $100 million. In an IPO or FO, a Greenshoe increases the deal size and results in a higher percentage of the company being sold to new investors.

WHAT MIGHT A SHAREHOLDER ANALYSIS TELL YOU ABOUT AN EQUITY DEAL?

- For an existing public company, a shareholder analysis compares current institutional investors to ones that the company might target in a new equity offering. For example, if one of your client's investors has a low percentage of holdings in the transportation industry, and the company is transportation-related, then your team may want to target this investor in the offering since it may want more exposure to the industry.
- You could also use this analysis to find institutional investors with similar industry holdings that have not yet invested in your client and target them in the offering.

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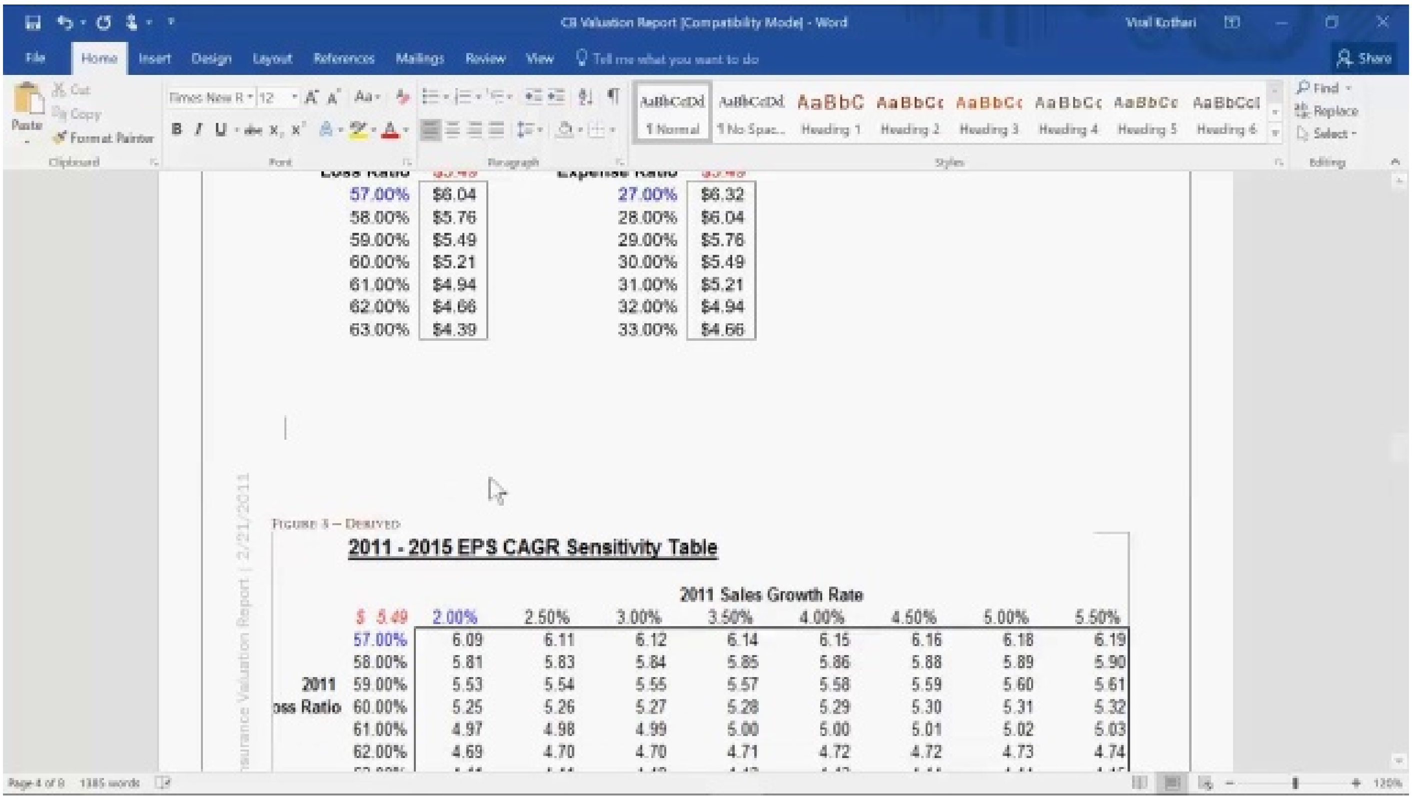
Chubb Limited Stock Valuation Walkthrough



Loss Ratio		Expense Ratio	
57.00%	$6.04	27.00%	$6.32
58.00%	$5.76	28.00%	$6.04
59.00%	$5.49	29.00%	$5.76
60.00%	$5.21	30.00%	$5.49
61.00%	$4.94	31.00%	$5.21
62.00%	$4.66	32.00%	$4.94
63.00%	$4.39	33.00%	$4.66

Figure 3 – Derived

2011 - 2015 EPS CAGR Sensitivity Table

2011 Sales Growth Rate

	$ 5.49	2.00%	2.50%	3.00%	3.50%	4.00%	4.50%	5.00%	5.50%
	57.00%	6.09	6.11	6.12	6.14	6.15	6.16	6.18	6.19
	58.00%	5.81	5.83	5.84	5.85	5.86	5.88	5.89	5.90
2011	59.00%	5.53	5.54	5.55	5.57	5.58	5.59	5.60	5.61
oss Ratio	60.00%	5.25	5.26	5.27	5.28	5.29	5.30	5.31	5.32
	61.00%	4.97	4.98	4.99	5.00	5.00	5.01	5.02	5.03
	62.00%	4.69	4.70	4.70	4.71	4.72	4.72	4.73	4.74

Watch video at https://www.wallstreetoasis.com/courses/technical-interview-course/module-3-stocks/chubb-limited-stock-valuation-walkthrough

Lesson files:

Relevant Files:

cb_valuation_report.pdf

chubb_financial_model.xlsx

chubb_valuation_report.pdf

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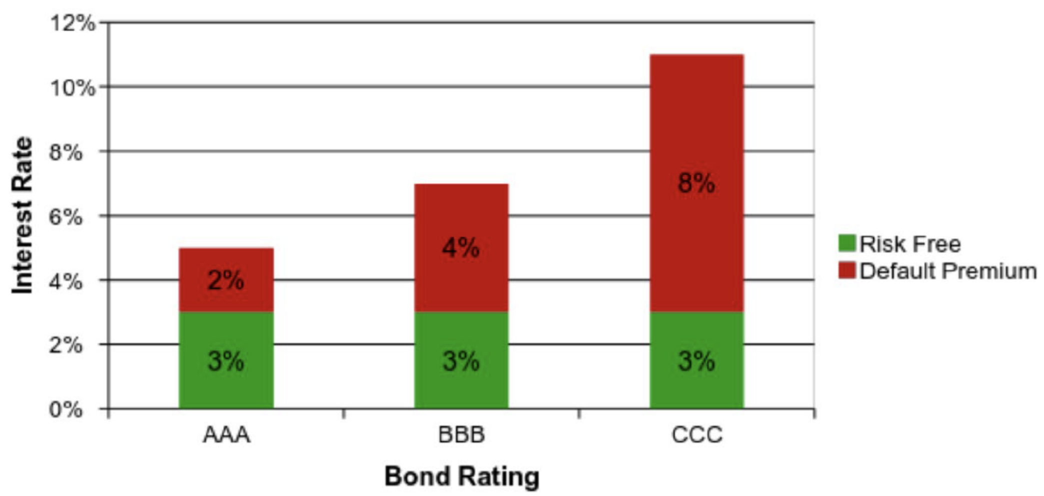
[Basic Concepts, Questions, and Case Studies]

Basic Concepts, Questions, and Case Studies

WHAT IS THE DEFAULT PREMIUM?

- The chart below is for illustrative purposes only. Current risk-free rates and default premiums may be different from those shown.

SAMPLE ANSWER: *The default premium is the difference between the yield on a corporate bond and the yield on a government bond with the same time to maturity to compensate the investor for the default risk of the corporation, compared with the "risk-free" comparable government security.*



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WHAT IS THE DEFAULT RISK?

SAMPLE ANSWER: *The default risk is the risk of a given company not being able to make its interest payments or pay back the principal amount of their debt. All else equal, the higher a company's default risk, the higher the interest rate a lender will require it to pay.*

WHAT IS "FACE VALUE"?

SAMPLE ANSWER: *Face value or par value of a bond is the amount the bond issuer must pay back at the time of maturity. Bonds are usually issued with a $1,000 face value.*

WHAT IS THE COUPON PAYMENT?

- The coupon payment on a bond or loan is the interest payment a company will pay to holders of the bond/loan.
- This coupon payment is the stated interest rate times the face amount of the bond or loan. Bonds typically make coupon payments annually or semi-annually while loans typically make interest payments once per quarter.
    - If a company issues 10% 7-year annual bonds with a face value of $1,000 each, annual coupon payments will be $100 each:

$$\frac{10\%\ interest\ x\ \$1000\ face\ value}{1\ payment\ per\ year}.$$

- The chart below shows the hypothetical cash flows with a $1,000 purchase in year zero, then a $100 coupon payment each year from years one through seven and the repayment of principal in year seven in addition the final coupon payment.

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SAMPLE ANSWER: *The coupon payment is the amount a company pays its loan and bondholders, usually on an annual, semi-annual or quarterly basis. It is the coupon rate, or interest rate times the face value of the bond. For example, the coupon payment on an annual 10% bond with a $1,000 face value would be $100.*

WHAT IS THE DIFFERENCE BETWEEN AN INVESTMENT GRADE BOND AND A "JUNK BOND"?

- An investment grade bond is one that has a good credit rating (AAA to BBB, Aaa to Baa) and a low risk of default and therefore pays a low interest rate. These are usually low-risk, fundamentally sound companies, which produce steady, reliable cash flows significantly greater than their interest requirements.
- A "junk bond" is a bond that has a poor credit rating (BB to D, Ba to C) and a relatively high risk of bankruptcy and is therefore required to pay investors a higher interest rate. These companies usually are characterized as having higher overall levels of debt (leverage) and potentially less consistent cash flows. They may also operate in relatively more volatile industries.

SAMPLE ANSWER: *An investment grade bond is a bond issued by a company that has a relatively low risk of bankruptcy and therefore has a low interest payment. A "junk bond" is one issued by a company that has a high risk of bankruptcy but is paying high interest payments.*

CREDIT RATINGS

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Moodys	S&P	Grade	Risk
Aaa, Aa, A	AAA, AA, A	Investment	Low Risk
Baa	BBB	Investment	Med Risk
Ba, B	BB, B	Junk	High Risk
Caa, Ca	CCC, CC, C	Junk	Highest Risk
C	D	Junk	In Default

WHAT IS THE DIFFERENCE BETWEEN A CORPORATE BOND AND A CONSUMER LOAN?

- In theory, a bond and a loan are similar in that they are both forms of debt. The "issuer" of a bond is like the "borrower" on a loan, and the "holder" of the bond is like the "creditor".
- Let's draw a parallel between a bond issuance from General Electric and a home loan taken out by John Smith. GE and John Smith are both looking to borrow money. GE is looking to borrow quite a bit more, so they need to go to the public markets and borrow money from lots of different sources while John Smith can just go to his local bank. GE structures a bond issuance for X dollars, with a term (say 10 years) and an interest rate (say 5%), which will be paid in a "coupon" payment each year. John Smith goes to the local bank, borrows Y dollars, agreeing to pay it back over a term (say 30 years) at an agreed upon interest rate (say 7%), which will be paid every year. Both loans and bonds have additional terms built into their structures.
- As you can see, the similarities are numerous. However, in order to raise the money, John simply borrows all his money from the bank. GE's process is a bit more complicated in that they must go out and market their bonds to the public, selling them to individuals and institutional investors across the globe, with the help of their investment bank of choice.

SAMPLE ANSWER: *The main difference between a corporate bond and a consumer loan is the market that it is traded on. A bond issuance is usually for a larger amount of capital, is sold in the public market and can be traded. A loan is issued by a bank, and is not traded on a public market.*

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HOW DO YOU DETERMINE THE DISCOUNT RATE ON A BOND?

SAMPLE ANSWER: *The discount rate is determined by the company's default risk. Some of the factors that influence the discount rate include a company's credit rating, the volatility of their cash flows, the interest rate on comparable U.S. Bonds, the amount of current debt outstanding, leverage and interest coverage.*

HOW DO YOU PRICE A BOND?

$$Price = \sum_{t=1}^{T} \frac{Coupon_t}{(1+r)^t} + \frac{Par\ Value}{(1+r)^t}$$

SAMPLE ANSWER: *The price of a bond is the net present value of all future cash flows (coupon payments and par value) expected from the bond using the current interest rate.*

- For the example below, assume the current interest rate is 7% on comparable bonds. The bond you are looking to invest in has a $100 face value and pays 10% annual interest. Since the bond you are investing in pays a higher coupon than bonds of comparable companies, you will be required to pay a premium for that higher interest rate, hence the $112.30 price, which brings the yield on the bond down to levels in line with comparables.

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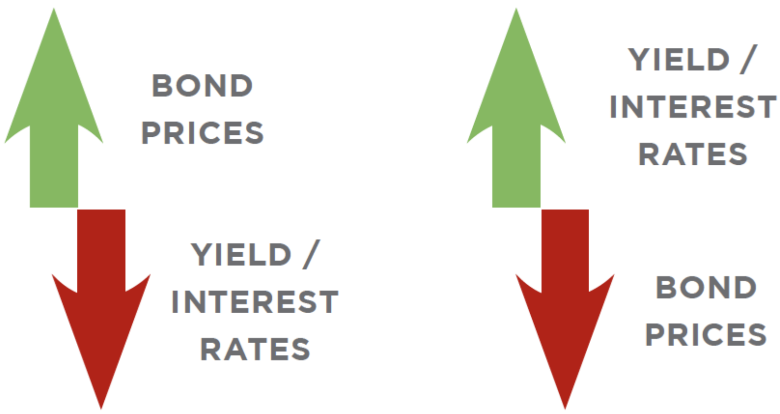
Year 1	$10 Coupon	PV=$10/(1+.07)	$9.34	
Year 2	$10 Coupon	PV=$10/(1+.07)^2	$8.73	
Year 3	$10 Coupon	PV=$10/(1+.07)^3	$8.16	
Year 4	$10 Coupon	PV=$10/(1+.07)^4	$7.63	
Year 5	$10 Coupon	$100 Principal	PV=$110/(1+.07)^5	$78.43
Price =	Sum of all PV's of Payments	$112.30		

IF THE PRICE OF A BOND GOES UP, WHAT HAPPENS TO THE YIELD?

SAMPLE ANSWER: *The price and yield of a bond move inversely to one another. Therefore, when the price of a bond goes up the yield goes down.*



IF YOU BELIEVE INTERESTS RATES WILL FALL, AND ARE LOOKING TO MAKE MONEY DUE TO THE CAPITAL APPRECIATION ON BONDS, SHOULD YOU BUY THEM OR SHORT SELL THEM?

- If you believe interest rates are going to fall bond prices should rise. If you are looking to make money on the capital appreciation of the bonds, you should be looking to buy the bonds.

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SAMPLE ANSWER: *Since price moves inversely to interest rates, if you believe interests rates will fall, bond prices will rise, and therefore you should buy bonds.*

WHAT IS THE CURRENT YIELD ON THE 10-YEAR TREASURY NOTE?

- This information changes daily and is available in The Wall Street Journal or any financial website.
- As of January 10, 2019 the yield on the 10-year was 2.78%

IF THE PRICE OF THE 10-YEAR TREASURY NOTE RISES, WHAT HAPPENS TO THE NOTE'S YIELD?

- The chart above showing the relation between bond prices and yields also applies to the relationship between Treasury notes and their yield.

SAMPLE ANSWER: *The price and yield are inversely related, so when the price goes up, the yield goes down.*

WHAT WOULD CAUSE THE PRICE OF A TREASURY NOTE TO RISE?

SAMPLE ANSWER: *If the stock market is extremely volatile, and investors are fearful of losing money, they will desire risk free securities, which are government bonds. The increase in demand for these securities will drive the price up, and therefore the yield will fall.*

IF YOU BELIEVE INTEREST RATES WILL FALL, SHOULD YOU BUY BONDS OR SELL BONDS?

SAMPLE ANSWER: *If interest rates fall, bonds prices will rise, so you should buy bonds.*

HOW MANY BASIS POINTS EQUAL 0.5 PERCENT?

- One basis point = 0.01 percent. Therefore 0.5 percent = 50 basis points

SAMPLE ANSWER: *Since one basis point is to one-hundredth of a percent, half a percent is fifty basis points.*

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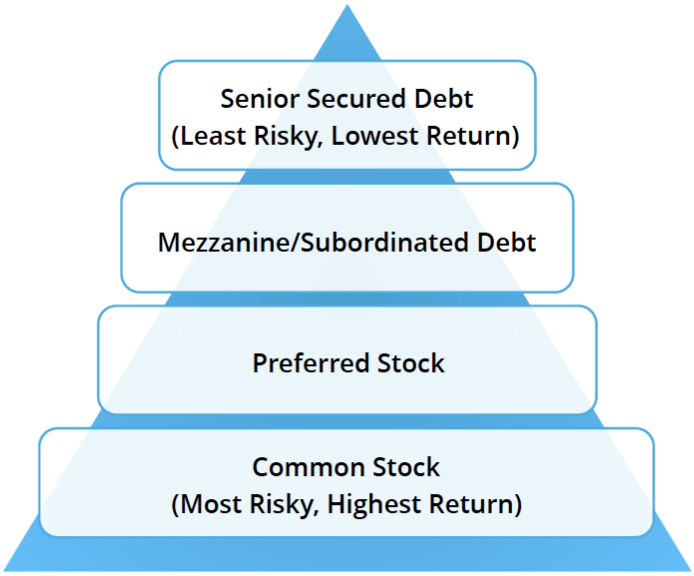
WHAT IS THE ORDER OF CREDITOR PREFERENCE IN THE EVENT OF COMPANY BANKRUPTCY?

- The order of preference is shown in the chart below. Those at the top of the pyramid have first claim on the firm's assets in the event of liquidation or sale, followed in order by those below them.



SAMPLE ANSWER: *The first creditors to get paid in the event of liquidation are the senior debt holders—usually banks and senior bondholders. They likely have some of the firm's assets as collateral. Next come those holding subordinated debt, followed by preferred stockholders. Common stockholders have the last claim on assets in the event of liquidation or bankruptcy.*

WHAT IS THE DIFFERENCE BETWEEN SENIOR SECURED DEBT OR "BANK DEBT" AND BONDS?

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Bank Debt	Bonds
Low Interest Rate	High Interest Rate
Floating Interest Rate	Fixed Interest Rate
Cash Interest Rate	May have PIK Interest
4-8 Year Tenor	7-12+ Year Tenor
Small Amortization	No Amortization
Prepayment is Allowed	No Prepayment
Banks, Loan Funds, CLOs	Diversified Investors
Secured by Company Assets	May be Unsecured
Normally has Maint. and Incur. Cov.	Incurrance Covenants

SAMPLE ANSWER: *The first difference is that bank debt is secured by the assets of the company and bonds many times are not, so the interest rate on bank debt is typically lower. Second, bank debt tends to have floating interest rates based on LIBOR plus a spread, whereas bonds normally pay at a fixed rate. Third, bank debt may carry financial maintenance covenants that require the company to maintain certain leverage levels, interest coverage levels, etc., while bonds do not. Fourth, bank debt is normally amortized at a certain percentage per year. The fifth and final difference is that bank debt tends to be pre-payable at any time, whereas bonds tend to have call protection for some years after issuance, ensuring that bonds remain outstanding. In smaller transactions, the deal may be uni-tranche (all bank debt), but in large transactions the capital structure could include first-lien bank debt, second-lien bank debt, AND bonds.*

WHY WOULD A COMPANY USE BANK DEBT RATHER THAN HIGH-YIELD BONDS?

SAMPLE ANSWER: *Bank debt is secured by the assets of the company and therefore normally commands lower interest rates. The trade off is that it will typically amortize and may have maintenance covenants.*

WHY MIGHT TWO BONDS WITH THE SAME MATURITY AND SAME COUPON, FROM THE SAME ISSUER, BE TRADING AT DIFFERENT PRICES?

- One of the bonds could be callable.
- One of the bonds could be putable.
- One of the bonds could be convertible.

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SAMPLE ANSWER: *There are a couple of explanations for the observed price difference. A bond that is putable or convertible would demand a premium, and a callable bond would trade at a discount.*

WHAT ARE BOND RATINGS?

- A bond rating is a grade given to a bond according to its risk of defaulting.
- The three best known and most trusted ratings agencies are Standard & Poor's, Moody's, and Fitch.
- Recently, ratings agencies have faced some skepticism about their ratings techniques because so many of the mortgage backed securities that were given very high ratings ended up defaulting.
- The lower the grade, the more speculative the stock, and all else equal, the higher the yield.
- See the chart from earlier for a visualization of the different ratings and agencies.

SAMPLE ANSWER: *A bond rating is a grade given to a bond based on its risk of defaulting. This rating is issued by an independent firm and updated over the life of the bond. The most trusted rating agencies are S&P, Moody, and Fitch, and their ratings range from AAA to C or even D. The top rating of AAA goes to highly rated "investment grade" bonds with a low default risk; the C rated bond is "non-investment grade" or "junk," and a rating of D means the bond is already in default and not making payments.*

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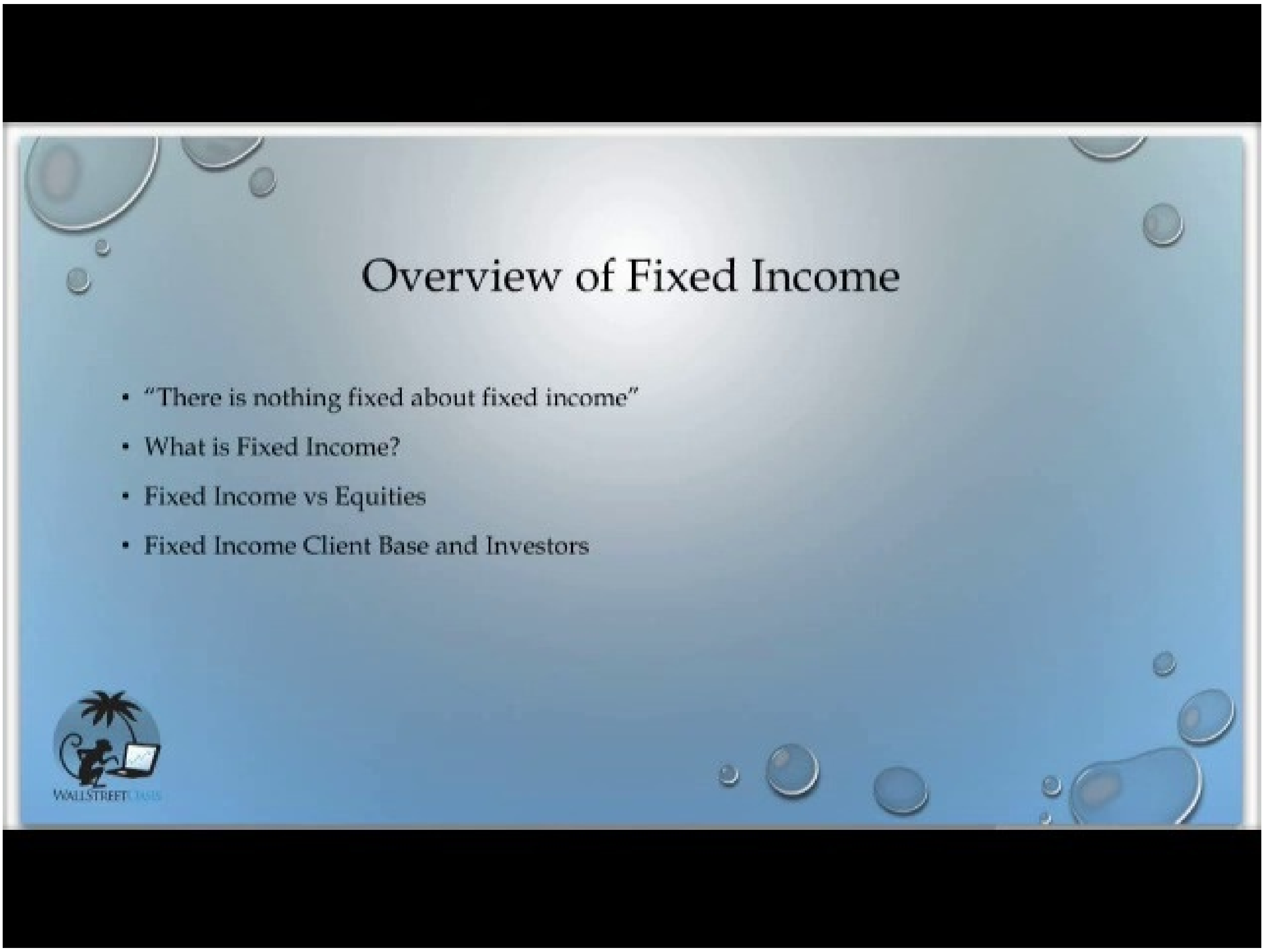

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Intermediate Concepts, Questions, and Case Studies

Intermediate Concepts, Questions, and Case Studies

WHAT IS THE YIELD TO MATURITY ON A BOND?

- The yield to maturity (YTM) is the rate of return on a bond if it is purchased today for its current price, held through its maturity date and is paid off in full at maturity.
- Normally, the yield to maturity is expressed as an annual rate.
- The calculation of YTM includes the current market price, the face value, the coupon payments, and the time to maturity.
- If the coupon yield of a bond (coupon/face) is lower than its current yield (coupon/price) it is selling at a discount.
- If the coupon yield of a bond (coupon/face) is higher than its current yield (coupon/price) it is selling at a premium.

SAMPLE ANSWER: *The yield to maturity on a bond is its rate of return if held through its maturity date, based on its current price, coupon payments, face value, and maturity date.*

SAMPLE FOLLOW UP QUESTION: If you purchase a $100 bond at a 5% discount to par value. The bond's coupon rate is 8% and matures in 5 years. What is the bond's approximate YTM?

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SAMPLE FOLLOW UP ANSWER: *You can approximate the YTM with: (Annual Interest + (Redemption Value – Bond Price) / # Years to Maturity) / ((Redemption Value + Bond Price) / 2). The annual interest is$8, the redemption value is 100 (since full repayment is assumed with YTM), the bond price is 95, and the # years to maturity is 5, so:*

YTM = (8 + (100 – 95) / 5) / ((100 + 95) / 2) >> YTM = (8 + 1) / 97.5 = 9.2%.

You could say, "Between 9% and 10%" in an interview. The intuition is that we earn 8% interest per year and also 1% on the bond's principal per year since it increases from 95% to 100% over 5 years.

SAMPLE FOLLOW UP QUESTION: What happens to te YTM and current yield on a bond if the company's credit ratings fall dramatically, but prevailing interest rates and the bond's coupon rate stay the same?

SAMPLE FOLLOW UP ANSWER: *The bond will start to trade at a discount to par value if the company's credit rating falls dramatically, so the bond's Current Yield will increase above the coupon rate. The bond's YTM should also increase because it's based on the assumption of full repayment upon maturity – even if that's no longer realistic. The bond's YTM should increase to a figure above the Current Yield because investors now earn interest plus an annualized gain from buying the bond at a discount and earning back its par value upon maturity.*

WHAT IS THE DIFFERENCE BETWEEN YIELD TO MATURITY AND YIELD TO WORST?

SAMPLE ANSWER: *Yield to maturity assumes the debt holder will maintain the investment through its maturity date, collecting all interest payments and being repaid in full when it matures. Yield to worst is the lowest potential yield an investor can earn on a debt investment short of default by the issuer. This means that if a bond is callable, or has other provisions, an investor could earn less than yield to maturity should the company exercise a prepayment option to get out of the bond early.*

WHAT WILL HAPPEN TO THE PRICE OF A BOND IF THE FED RAISES INTEREST RATES?

SAMPLE ANSWER: *If interest rates rise, newly issued bonds offer higher yields to keep pace. This makes existing bonds with lower coupon payments less attractive, and their price must fall to raise the yield enough to compete with the new bonds.*

WHAT IS A EURODOLLAR BOND?

- Note that a Eurodollar bond does not have to be issued by a company actually in Europe, it can

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be a bond issued by any foreign company.

SAMPLE ANSWER: *A Eurodollar bond is one issued by a foreign company but in U.S. Dollars rather than the home currency.*

WHAT IS A CALLABLE BOND?

- A callable bond has a price (or prices) built into the bond indenture that allow the issuer to buy back the bond on a certain date (or dates) usually for a premium over the face value of the bond.

SAMPLE ANSWER: *A callable bond allows the issuer of the bond to redeem the bond prior to its maturity date, thus ending coupon payments. However, a premium is usually paid by the issuer to redeem the bond early.*

WHAT IS A PUT BOND?

SAMPLE ANSWER: *A put bond is essentially the opposite of a callable bond. A put bond gives the owner of bond the right to force the issuer to buy back the security (usually at face value) prior to maturity.*

WHAT IS A CONVERTIBLE BOND?

- Within the bond indenture of a convertible bond are a specified number of shares of common stock that each bond can be "converted" into at a time of the bondholders' choosing. If the value of those shares exceeds the face value of the bond, the investor typically will convert the bond.

SAMPLE ANSWER: *A convertible bond can be "converted" into equity during the bond's lifetime. Therefore, the bond can be converted before maturity should the bondholder decide that equity in the company is worth more than the bond.*

WHAT IS A PERPETUAL BOND?

SAMPLE ANSWER: *A perpetual bond is a bond that simply pays a coupon payment indefinitely (or until the company goes into default) and never returns a principal amount.*

HOW WOULD YOU VALUE A PERPETUAL BOND THAT PAYS A $1,000 COUPON PER YEAR?

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$$Value\ of\ Perpetual\ Bond = \frac{Coupon\ Payment}{Current\ Interest\ Rate\ on\ Comparable\ Bonds}$$

SAMPLE ANSWER: *A perpetual bond is one that pays coupon payments regularly for eternity, with no repayment of principal (par value). The value of the bond will be coupon payment divided by the current interest rate. If the interest rate on comparable bonds were 10%, a bond paying a $1,000 coupon would be $1,000/10% or $10,000.*

WHEN SHOULD A COMPANY ISSUE DEBT INSTEAD OF EQUITY?

SAMPLE ANSWER: *A company will normally prefer to issue debt because it is cheaper than issuing equity. In addition, interest payments are tax deductible and therefore provide tax shields. However, a company has to have a steady cash flow to make coupon payments, whereas that is not necessary when issuing equity. A company may also try to raise debt if it feels its stock is particularly undervalued such that an equity offering would not raise the capital needed.*

SAMPLE FOLLOW UP QUESTION: Why might a company issue a convertible bond rather than traditional debt or equity?

SAMPLE FOLLOW UP ANSWER: *A Convertible Bond is a compromise solution that lets companies borrow more cheaply than they could with traditional debt – but with possible share dilution in the future if the bonds convert into shares. A company might issue a Convertible Bond if debt is cheaper than equity for the company, but it has trouble meeting its targeted credit stats and ratios with a normal debt issuance. Also, the company must be in an appropriate industry and at the right growth stage. High-risk, high-growth companies in industries such as technology and biotech tend to issue Convertible Bonds more often than those in other industries.*

IF YOU BELIEVE INTEREST RATES WILL FALL, WHICH SHOULD YOU BUY: A 10-YEAR COUPON BOND OR A 10-YEAR ZERO-COUPON BOND?

SAMPLE ANSWER: *The price of a zero-coupon bond is more sensitive to fluctuations in interest rates, and the price moves in the opposite direction of interest rates. So, when interest rates fall, the price of the zero-coupon bond will rise more than the price of the coupon bond. Therefore, if you believe interest rates will fall, you should purchase the zero-coupon bond.*

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WHICH IS RISKIER, A 30-YEAR COUPON BOND OR A 30-YEAR ZERO-COUPON BOND?

- A zero-coupon bond is riskier since you will receive no payments until the final redemption date, whereas on a coupon bond you will receive payments over the life of the bond.
- According to the chart below, if the company were to default in Year 4, an investor in the coupon bond would have collected $30, while the holder of the zero-coupon bond would have received nothing.
- The price of a zero-coupon bond is also more sensitive to interest rate fluctuations, increasing its level of risk.
- To make up for the fact that a zero-coupon pays no coupon, the bond will be sold at a steep discount to its face value.

SAMPLE ANSWER: *A zero-coupon bond will yield $0 until its date of maturity, while a coupon bond will pay out some cash every year. This makes the coupon bond less risky since even if the company defaults prior to the bond's maturity date, you will have received some payments with the coupon bond.*

Year	Zero Coupon Bond	5 Year 10% Coupon
1	$0	$10
2	$0	$10
3	$0	$10
4	$0	$10
5	$100	$110

HOW COULD INFLATION HURT CREDITORS?

- Inflation cuts into the real percentage return that creditors make when they lend out money at a

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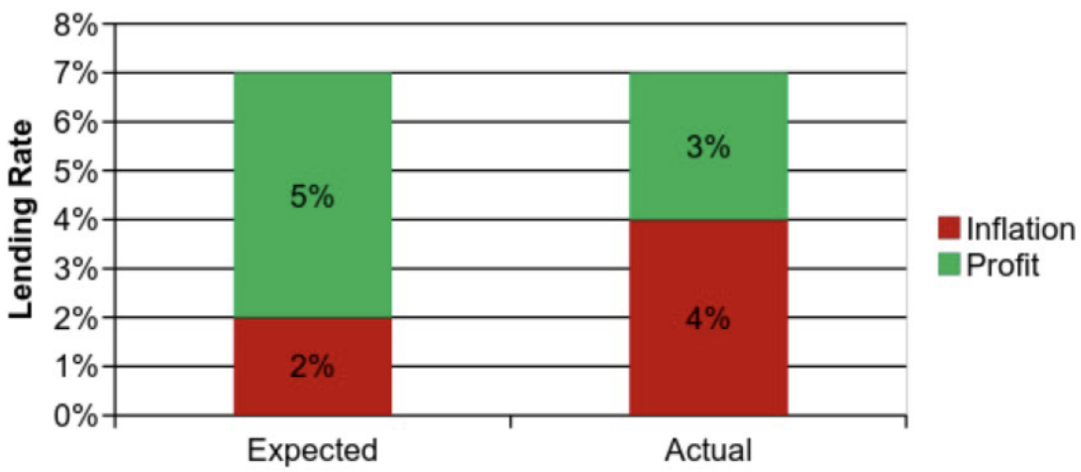
fixed rate.

- When a bank sets its lending rate, it projects a certain rate of inflation and then assigns a level of return it wants to capture, over and above the inflation rate, based on the riskiness of the borrower.

- For example, if a bank lends at 7%, expecting 2% inflation, they expect to make a 5% real gain based on the riskiness of the loan. However, if inflation increases to 4%, they are only making a 3% real return on their loan.

SAMPLE ANSWER: *Inflation can severely injure creditors. Creditors assign interest rates based on the risk of default as well as the expected inflation rate. Creditors lending at 7% with inflation expected at 2%, are expecting to make 5%. But if inflation actually increases to 4%, they are only making 3%.*



HOW WOULD YOU VALUE A ZERO-COUPON PERPETUAL BOND?

- This is a trick question. A perpetual bond has no maturity date and is not redeemable; therefore it pays only coupon payments. A zero-coupon bond makes no interest payments; it just pays back its face value at maturity. If a zero-coupon bond is also a perpetual bond, it will never pay out anything, and is therefore worth nothing.

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SAMPLE ANSWER: *Since a zero-coupon bond doesn't have any interest payments, and a perpetual bond has no par value, the value of a zero-coupon perpetual bond is zero because it will pay out nothing.*

IF THE STOCK MARKET FALLS, WHAT WOULD YOU EXPECT TO HAPPEN TO BOND PRICES AND YIELDS?

SAMPLE ANSWER: *When the stock market falls, investors flee to safer securities, like bonds. This increases the demand for those securities and therefore raises their price. Since prices and yields move inversely, if bond prices rise, their yields will fall. In that case, the government may lower interest rates in an attempt to stimulate the economy.*

WHAT ARE SOME WAYS TO DETERMINE THE EXTENT TO WHICH A COMPANY POSES A CREDIT RISK?

- The easiest way to determine a company's credit risk is to look at its credit rating, available from Standard & Poor's, Moody's and Fitch.
- If you wanted to perform your own analysis, some metrics to look at would be the Current Ratio, Quick Ratio, Interest Coverage Ratio, and Leverage Ratio.

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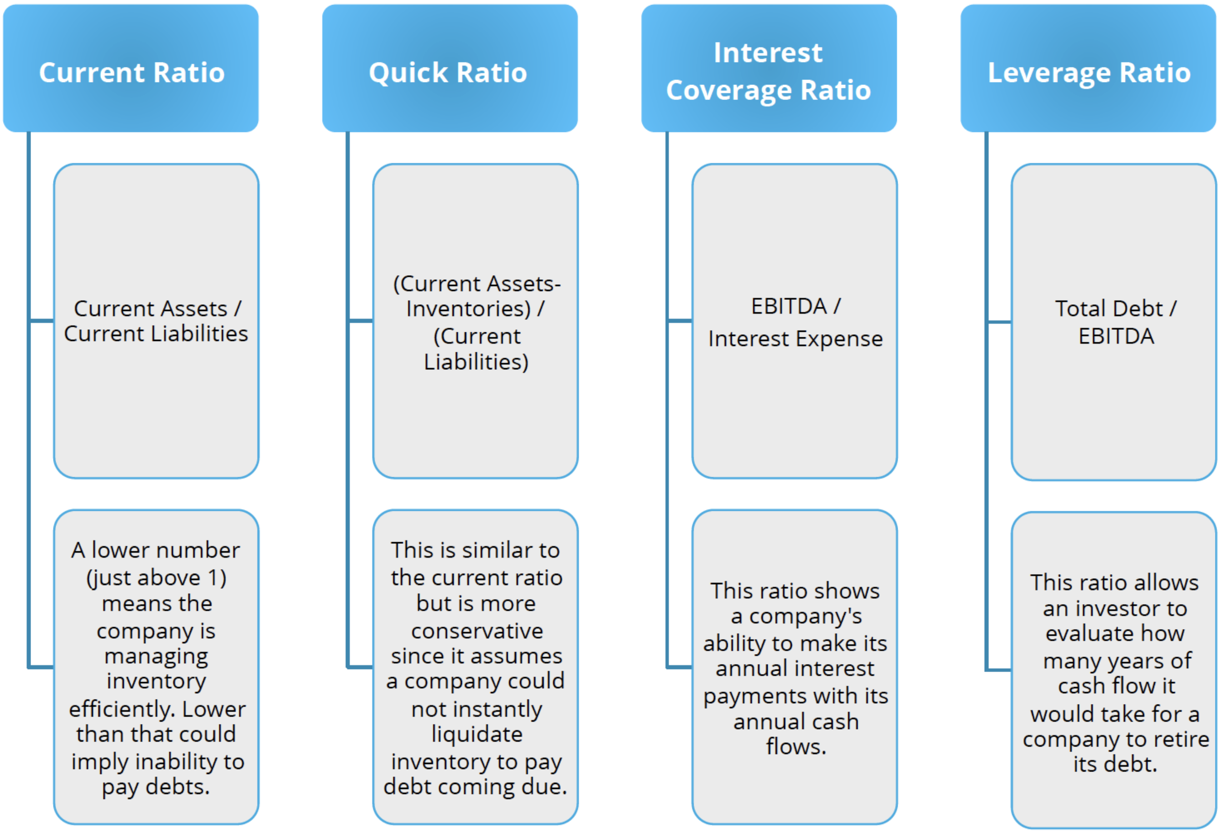

- Compare these ratios to those of similar companies in the same industry.
- Look at a company's cash flows and evaluate how steady/consistent they are. A company with more predictable cash flows poses less default risk.
- Also consider how much the company must pay each year in maintenance capital expenditures.

SAMPLE ANSWER: *Determining the credit risk of a company takes an incredible amount of work and research. However, some quick checks can include credit ratings from Moody's and Standard and Poor's, the current ratio, quick ratio, interest coverage ratio, leverage ratio, and debt to equity ratio, compared to those of similar companies in the same industry.*

WHY IS A FIRM'S CREDIT RATING IMPORTANT?

SAMPLE ANSWER: *The lower a firm's credit rating, the higher its risk of bankruptcy, according to ratings agencies, and therefore the higher its cost of borrowing capital.*

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WHAT IS THE DIFFERENCE BETWEEN A CORPORATE BOND AND A CORPORATE LOAN?

- Bonds and loans are both forms of debt a company will use to finance operations.
- A company will hire a bank to issue a loan or complete a bond underwriting.
- When issuing a loan, a bank or other financial institution will lend a company a certain amount of money and then may syndicate the loan to institutional investors that are required to meet certain requirements in order to invest. Additionally, those investing in the loan can "go private" on the name which will restrict them from investing in public securities such as stocks and bonds, but will give them access to additional, more detailed financial information about the company they are investing in.
- In a bond offering, an investment bank will go to market with the size and interest rate required by the company. The bank will then offer the bond to institutional investors such as mutual funds. The requirements for investing in bonds are less stringent than those for investing in loans; hypothetically, the average investor could invest in individual corporate bonds.
- A corporate loan will usually be secured by the assets of the firm; a bond may or may not be secured. Bonds are also normally subordinated to bank loans. Therefore, if a company issues both bank loans and bonds, their bonds will typically pay a higher interest rate (all else equal).

SAMPLE ANSWER: *While both loans and bonds are forms of debt, there are several differences between them. One difference is that a loan will be syndicated by a bank who leads the deal and then sells pieces of the loan to other investors such as loan funds and CLOs. A bond will be underwritten by a bank that will go on a road show to sell the issue to other financial institutions like mutual funds. Another difference is that a bank loan is a private security in which investors may have access to private, more detailed information about the company's operations, which then prohibits them from investing in public bonds or stocks. Bondholders have access only to public information and are therefore not restricted. Yet another difference is that bank loans are usually secured by all assets of the company, while bonds may or may not be secured. Bonds are also lower in the capital structure and will be repaid in bankruptcy after loans are, so all else equal, bonds will have a higher interest rate.*

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WHAT IS A FLOATING INTEREST RATE?

- Floating rate interest is used to protect against fluctuations in interest rates.
- A floating interest rate is typically seen on bank loans and is set at LIBOR (the London Interbank Offer Rate) plus a certain number of basis points (the spread). For example, a company may get a term loan at L+600bps (6.00%). If LIBOR is at 1%, interest payments will be 7% (1% + 6%) per year. However, if LIBOR increases to 4%, the company will be required to pay 10% annually. The higher the borrower' default risk, the higher the spread.
- Many floating rate loans will have a "LIBOR floor" because LIBOR is so low right now. This LIBOR floor is typically between 1% and 1.5% and means the company will pay the higher of LIBOR plus the spread, or the LIBOR floor plus the spread. In 2012, since LIBOR is below 0.4%, most loans will pay interest based on their LIBOR floors.

SAMPLE ANSWER: *Floating rate interest is typically seen on bank loans when a bank makes a loan to a company at a rate that will move with interest rates. The loan's rate typically is LIBOR plus a certain spread based on the default risk of the borrower.*

WHAT IS PIK INTEREST?

- PIK stands for Paid In Kind
- When a company issues PIK interest, rather than making cash payments to bond/loan holders, the face value of its investment will increase.
- A company may look to issue debt with PIK interest if it is wants to limit cash interest payments in the near term and is willing to make slightly higher future payments.
- A company may also issue debt that has both a PIK and a cash component. For example, if a company's cost of debt is 10%, it may negotiate a bank loan that pays interest at 5% cash and 5% PIK.

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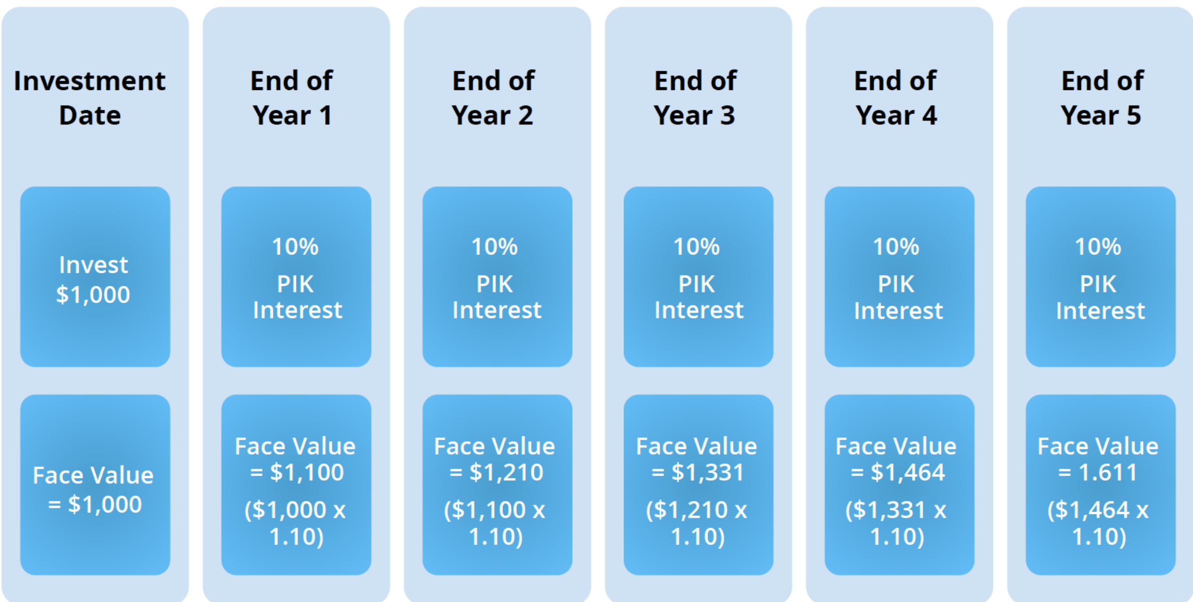
- For simplicity's sake, let's take a $1,000 bond that pays an annual coupon of 10% and has a 5-year maturity.
- As shown in the following chart, the bond will accrete in value over its lifetime and due to compounding, it will actually return a higher money multiple than if the investor were to receive annual cash interest payments. A $1,000 investment will be repaid $1,611 at the end of five years, whereas an equivalent bond paying cash would return $1,500 spread over the course of the five years.

SAMPLE ANSWER: *PIK interest is interest that is Paid In Kind. This means that rather than making a cash interest payment, the bond or loan will increase in face value each period by the PIK interest rate. Because of compounding, the company will be required to pay more overall, but the cash outflow will be at maturity rather than annually, semi annually, or quarterly.*



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WHAT ARE COVENANTS?

- Covenants are requirements a company must comply with according to the legal documents governing a loan or bond in order to avoid defaulting on it.
- Covenants can be either financial or technical in nature. Financial covenants may include maintaining a certain leverage ratio, limiting spending on capital expenditures, paying dividends, etc. Technical covenants may include financial reporting requirements, such as producing monthly financial statements within 30 days of month end.
- If a company breaches a covenant it is technically in default; however, a lender may elect to waive the covenant (normally for a fee) and not force the company into bankruptcy.
- Not all loans and bonds have covenants; many recent loans have been issued "covenant-lite," which means the company is required to comply with no covenants at all.

SAMPLE ANSWER: *A covenant is a requirement included in the legal documents governing a bond or loan. The company must comply with these requirements during the life of the bond or loan in order to avoid a default.*

WHAT IS AMORTIZATION?

- Amortization is a feature that may be built into a loan requiring the borrowing company to pay off the loan over its term rather than paying the entire face value at maturity.
- Each payment period, the company pays its lenders the interest payment and a portion of the loan's face value.
- Since the pay down of face value reduces the amount outstanding, interest payments will grow successively smaller.
- In the below example, the company borrows $1,000 at a 10% interest rate with a $100/year amortization schedule and a 5-year maturity.

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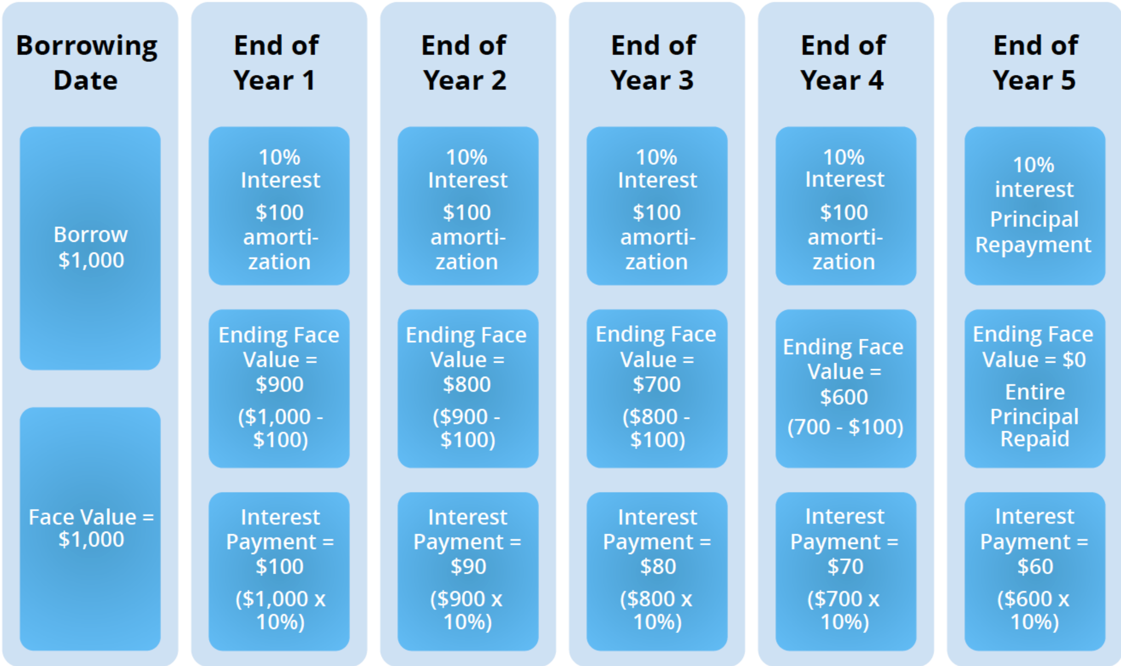

HOW ARE CONVERTIBLE BONDS ACCOUNTED FOR IN CALCULATING ENTERPRISE VALUE?

SAMPLE ANSWER: *If the convertible bonds are "in the money" meaning the conversion price is below the current market price, then you account for the bonds as additional dilution to the Equity Value. However, if the bonds are out of the money, then you would account for them as debt at their face value.*

WOULD LENDERS EVER PAY ATTENTION TO SCENARIOS OTHER THAN THE DOWNSIDE CASES IN A CREDIT MODEL

SAMPLE ANSWER: *Yes, potentially. Lenders focus on the Downside cases because their upside is limited to the interest rate on the Debt, while their downside consists of losing everything. However, some forms of Debt, such as Mezzanine, may offer warrants or equity co-investment options, which could affect the numbers significantly.*

For example, if the Downside case numbers look bad (e.g., a decent chance of recovering only 80% of a loan's principal), the lender might do the deal anyway if the equity options make the IRR high enough in the Base or Upside cases.

SAMPLE FOLLOW UP QUESTION: How might you determine the numbers for revenue growth, margins, and CapEx in downside cases of a credit model?

SAMPLE FOLLOW UP ANSWER: *First, you could look at the company's historical performance in recessions and see how its growth and margins have fallen and how its CapEx spending has changed when the economy has contracted. You could also look at peer companies that have not performed well and see*

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how much their growth and margins have declined. Finally, you also have to consider the company's industry and maturity. A mature retailer with high fixed costs and inventory could easily crash and burn if demand falls, while a professional services company could adapt more smoothly by reducing its headcount.

SAMPLE FOLLOW UP QUESTION: You are building a credit model for a furniture retailer, a luxury hotel chain, and a real estate company that owns multifamily units (ie rental apartments). Which would you expect to have the most extreme downside case?

SAMPLE FOLLOW UP ANSWER: *The luxury hotel chain will have the most extreme Downside case because hotel spending, especially in the luxury segment, declines far more than furniture spending or apartment rent in a downturn. There might be a modest decline in apartment rents (e.g., 3-5%) during a recession as landlords try to attract new tenants, and furniture sales might also decline modestly (e.g., 5-10%) as fewer people buy homes and redecorate. But luxury hotel spending falls off a cliff in a downturn – declines of 20-30% would not be unusual.*

WHAT WOULD CAUSE A COMPANY'S CREDIT RATING TO CHANGE?

SAMPLE ANSWER: *A company's credit rating might change if its credit statistics, such as Debt / EBITDA or EBITDA / Interest, improve or worsen significantly, or its qualitative risk factors change. For example, if peer companies with "BB+" credit ratings have Debt / EBITDA between 4x and 5x, and the Debt / EBITDA of the company you're analyzing suddenly jumps to 6x, rating agencies will be likely to downgrade the company. But even if a company's financial stats stay the same, its credit rating might decline if its industry experiences a downturn, a major new competitor enters, or the growth outlook falls.*

SAMPLE FOLLOW UP QUESTION: Why are ratios such as debt/EBITDA and EBITDA/interest important even if a company's debt has no maintenance convenants?

SAMPLE FOLLOW UP ANSWER: *Because lenders and rating agencies still judge a company based on these metrics, even if the company is not "required" to keep them above or below certain levels. For example, rating agencies often establish credit rating "bands" of Debt / EBITDA ratios (e.g., investment- grade companies might have Debt / EBITDA below 2x) and use them as guidelines to determine the ratings. Also, some Debt investors become unwilling to invest in a company's Debt beyond certain thresholds. For example, Term Loan investors might go up to 2x Debt / EBITDA, and Senior Note investors might go up to 3- 4x Debt / EBITDA. But if the company wants to raise Debt beyond those levels, it will have to consider sources like Subordinated Notes or Mezzanine.*

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SAMPLE FOLLOW UP QUESTION: What conclusions can you draw if a company's EBITDA cushion for its interest coverage ratio convenant is 10% in the downside case, but its leverage ratio covenant has a cushion of 50%?

SAMPLE FOLLOW UP ANSWER: *This means the company's Debt / EBITDA ratio is acceptable if things go wrong, but its EBITDA / Interest covenant is in danger of being breached if the company underperforms. The company could solve this issue by negotiating for Debt with lower interest rates but offering other terms that are more favorable to the lender, or by raising Debt with no maintenance covenants.*

IF A COMPANY'S CASH FLOW FLUCTUATES GREATLY FROM YEAR TO YEAR, WHICH FINANCING SOURCE IS MOST APPROPRIATE FOR IT?

SAMPLE ANSWER: *"Anything that lacks maintenance covenants" is the best answer here. But, more specifically, it depends on how much the company's cash flow fluctuates. If the fluctuations are moderate, and the company never moves into crazy territory with its credit stats and ratios (e.g., nothing like 15x Debt / EBITDA), then it may be able to issue Senior Notes or Subordinated Notes, which have higher interest rates than Term Loans but which lack maintenance covenants. But if the company's cash flows are so unstable that it can't maintain reasonable leverage or coverage ratios, then it will have to use more Equity and possibly skip Debt altogether.*

WHY IS VALUING A BOND MORE DIFFICULT THAN IT APPEARS?

SAMPLE ANSWER: *When a company initially issues a bond to investors to raise capital, it is straightforward to model. But in the secondary markets – where investors buy and sell bonds from other investors – it gets more complicated. First off, the bond's market price can change over time. The timing also gets tricky because bonds pay interest at different intervals, and a new investor may have to pay for "Accrued Interest" if he/she purchases the bond in between interest payments. Also, bonds often have embedded call, put, and conversion options, all of which complicate the analysis. Finally, some bonds also have warrants or equity options attached, which make it trickier to calculate the yields.*

SAMPLE FOLLOW UP QUESTION: What are the main factors influencing a bond's price?

SAMPLE FOLLOW UP ANSWER: *The bond's coupon rate, prevailing interest rates on similar bonds in the market, and the company's creditworthiness make the biggest impact on the bond's market price. All of them appear in the pricing formula for a bond, but the company's creditworthiness makes a more indirect impact since it affects the "Redemption" term (lower creditworthiness means that the expected repayment percentage may be below 100%)*

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Why Does the Yield Curve (Usually) Slope Upward?

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Inflation: Why Are People Worried?

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IB Case: Public Side Lender Presentation

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Leveraged Loan Market

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[Advanced Concepts, Questions, and Case Studies]

Advanced Concepts, Questions, and Case Studies

Realistically, however, you are unlikely to get these complex questions on this topic unless you've had prior credit experience.

WHAT STEPS CAN THE FED TAKE TO INFLUENCE THE ECONOMY?

- Open market operations
  - Open market operations are The Fed buying and selling securities (government bonds) to change the money supply. Buying government securities increases the money supply and stimulates expansion; selling securities shrinks the money supply and slows the economy.

- Raise or lower interest rates
  - The discount rate is the interest rate The Fed charges banks on short-term loans.
  - The federal funds rate is the rate banks charge each other on short-term loans.
  - When The Fed lowers these rates, it signals an expansionary monetary policy.

- Manipulate the reserve requirements
  - The reserve requirement is the amount of cash a bank must keep on hand to cover its deposits (money not loaned out). When this requirement is lowered, more cash can be

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loaned and pumped into the economy, so lowering the reserve requirement is expansionary policy.

HOW DOES X ECONOMIC EVENT AFFECT INFLATION, INTEREST RATES, AND BOND PRICES?

Economic Events and Their Impacts

Economic Event	Effects		
	Inflation	**Interest Rates**	**Bond Prices**
Unemployment figures are low	Up	Up	Down
Dollar weakens against Yen	Up	Up	Down
Consumer confidence is low	Down	Down	Up
Stock market drops	Down	Down	Up
Companies report healthy earnings	Up	Up	Down

Economic Indicators: Positive & Negative Directions

Indicator	Positive Economic Event	Negative Economic Event
GDP	Up	Down
Unemployment	Down	Up
Inflation	Down	Up
Interest Rate	Down	Up
New Home Sales	Up	Down
Existing Home Sales	Up	Down

HOW WOULD THE FOLLOW SCENARIO AFFECT INTEREST RATES? THE PRESIDENT IS IMPEACHED AND CONVICTED.

- Any negative news about the country as a whole may lead to fears that the economy will suffer,

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so The Fed would most likely lower interest rates to stimulate economic expansion.

WHAT IS DURATION?

- Duration is how sensitive a bond's price is to changes in interest rates and is expressed as a number of years. The calculation is relatively complicated and requires present value, yield, coupon, final maturity, and any call features. However, duration is normally presented to investors and is not something they typically calculate on their own.
- The duration of a bond or bond fund allows an investor to evaluate the investment's interest rate risk. If investors believe there is a great risk that interest rates will rise (and therefore prices will fall), they may shy away from bonds or funds with high durations due to their sensitivity to interest rate fluctuations.
- The cash flows (coupon payments) at the beginning of a bond's life are "worth more" in present value terms because they do not have to be discounted for as many years.
- When interest rates rise, the PV of future cash flows go down more than those earlier in the bond's life cycle.

SAMPLE ANSWER: *Duration is a measure of the sensitivity of the price of a bond to a change in interest rates. Duration is expressed as a number of years. When interest rates rise, bond prices fall, and falling interest rates mean rising bond prices. Formally, duration is the "weighted average maturity of cash flows". In simple terms, it is the price sensitivity to changes in interest rates. If cash flows occur faster or sooner, duration is lower and vice versa. In other words, a 4 year bond with semi-annual coupons will have a lower duration than a 10 year zero-coupon bond. The larger the duration number, the greater the impact of interest-rate fluctuations on bond prices.*

WHAT IS CONVEXITY?

SAMPLE ANSWER: *Convexity measures the relationship between bond prices and bond yields. It is used as a tool to manage risk and measure the amount of exposure on a portfolio of bonds. If bond A has a higher convexity than bond B, bond A will have a higher price than bond B. As the convexity of a bond portfolio increases, the systematic risk to that portfolio increases. This means that the higher the convexity of the portfolio, the more sensitive it is to overall fluctuations in interest rates. As a general rule, the higher the coupon rate, the lower the convexity of a bond.*

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SAMPLE FOLLOW UP QUESTION: Why is the relationship between bond prices and prevailing interest rates convex?

SAMPLE FOLLOW UP ANSWER: *This relationship is convex because declining interest rates make more of an impact on a bond's market price than rising interest rates. So, if you plot them on a graph, the slope gets steeper as interest rates decline. As the prevailing interest rates decline, the discount factors in the Present Value formula decrease more and more quickly, which increases the bond's value non-linearly.*

WHAT DOES THE GOVERNMENT DO WHEN THERE IS A FEAR OF HYPERINFLATION?

- To slow the economy and defuse hyperinflation, the government can use taxation and government spending to regulate the level of economic activity.
  - Increasing taxes and decreasing government spending slows down growth in the economy and fights inflation.
  - Additionally, raising key interest rates will slow the economy; reduce the money supply, and slow inflation.

SUPPOSE A REPORT RELEASED TODAY SHOWED THAT INFLATION LAST MONTH WAS VERY LOW, YET BOND PRICES CLOSED LOWER. WHY MIGHT THIS HAPPEN?

SAMPLE ANSWER: *This could occur because bond prices are based on expectations of future inflation. Bond traders may expect future inflation to be higher, and therefore today's demand for bonds might be lower, increasing the yields to match the increased inflation expectations.*

SHOULD THE COUPON RATE OF A BOND WITH CALL PROTECTION BE HIGHER OR LOWER THAN ONE WITHOUT CALL PROTECTION?

SAMPLE ANSWER: *The coupon rate should be lower because call protection reduces the risk for the bond investors. Lower risk means a lower potential return, so the coupon rate should be lower to compensate. Call protection reduces the risk for investors by ensuring that the company cannot repay bonds early ("calling the bonds") for several years, and then allowing early repayment, but only at a premium to par value.*

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SAMPLE FOLLOW UP QUESTION: Why do the redemption premiums on callable bonds tend to decrease as the bond approaches maturity?

SAMPLE FOLLOW UP ANSWER: *Because investors' yield drops the most if a company calls a bond early into its maturity period (e.g., Year 4 rather than Year 9 in a 10-year period). To protect investors against that risk, redemption premiums tend to start off relatively high once the bond becomes callable (e.g., 105 to 110) and then decrease each year, often equaling the bond's par value (100) just before its maturity.*

WHY DO MAKE WHOLE PROVISIONS STRONGLY DISCOURAGE COMPANIES FROM CALLING BONDS EARLY?

SAMPLE ANSWER: *Because Make-Whole Provisions are, effectively, extremely high redemption premiums. To calculate the Make-Whole Provision, you sum up the Present Value of the bond's future cash flows at a discount rate that's just above the risk-free rate (e.g., the 10-year U.S. Treasury rate). This discount rate is almost always far below the prevailing interest rates on similar bonds and, as a result, the bond's value is significantly higher at this rate. It's not unusual for the company to repay 110% or 120% of the bond's par value if it calls the bond extremely early (e.g., Year 1 or 2 in a 10-year maturity) and there's a Make-Whole Provision. That high a premium rarely make economic sense, so Make-Whole Provisions strongly discourage companies from calling bonds early.*

WHAT STATISTICS ARE THE MOST IMPORTANT IN THE ANALYSIS OF COMPARABLE DEBT ISSUANCES?

SAMPLE ANSWER: *You typically screen the issuances by industry, geography, size, time, and credit rating; it doesn't make sense to compare Microsoft to a tech startup that just went public. You look at statistics such as the median coupon rate, offering amount, bond price, maturity, YTW, YTM, and interest and coverage ratios to determine if your proposed issuance has appropriate terms. For Convertible Bonds, you would also look at the median Conversion Ratio and Conversion Premium to ensure that your offering is in-line with similar, recent issuances.*

IF A COMPANY WANTS TO EXTEND THE MATURITY OF ITS BONDS BY REFINANCING, HOW MUGHT YOU ADVISE IT?

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SAMPLE ANSWER: *At a high level, you want to ensure that the bond investors receive a similar yield with a similar risk profile when the company refinances its bonds. You can measure these attributes with the YTM, YTW, and Duration of the bonds and the company's credit rating before and after the issuance. You would aim to issue new bonds that offer a similar yield and Duration and which do not negatively impact the company's credit rating. For example, if the new bonds mature 2-3 years later than the old bonds, then the company might have to offer better terms to win over investors, such as a higher coupon rate or higher call premiums (since the interest-rate risk is higher with a longer maturity).*

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Two high yield bonds with identical coupons and maturities, which do you buy?

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IB Deal Walkthrough: Public Lender Presentation

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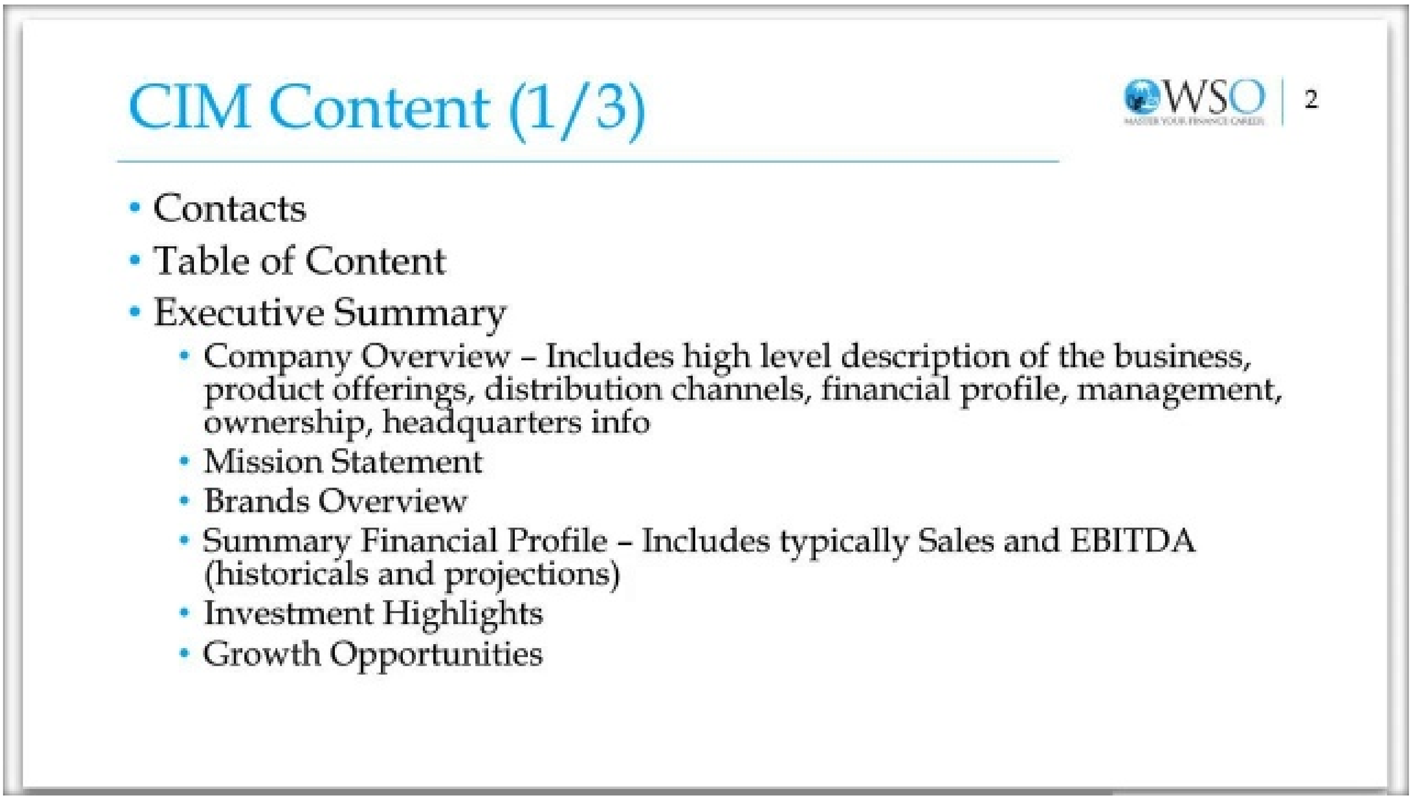
IB Deal Walkthrough: Sellside Bankruptcy



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Basic

Basic

WHAT IS THE SPOT EXCHANGE RATE?

- The spot exchange rate is the rate of a foreign-exchange contract for immediate delivery. Spot rates are the price a buyer will pay “on the spot” for a foreign currency.

Spot Exchange Rates

Currency	Value of US $1 in Dec '08	Value of US $1 in Jul '15	Value of US $1 in Jan '19
British Pound	0.68	0.64	0.78
Euro	0.71	0.92	0.87
Japanese Yen	90.20	124.05	108.55
Chinese Yuan	6.84	6.21	6.76
Brazilian Real	2.35	3.13	3.71
Mexican Peso	12.86	15.79	19.14
Canadian Dollar	1.00	1.29	1.33

WHAT IS THE FORWARD EXCHANGE RATE?

- The forward rate is the price at which currencies will be exchanged for at some given date in the future.

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- The forward rate is used by speculators as well as companies looking to hedge their foreign exchange risk and lock in a future exchange rate.
- For example, a company which will be receiving payment in the future (in a foreign currency) may want to budget the receivable. If it cannot lock in an exchange rate for future incoming cash flows, the company will have difficulty setting an accurate budget. However, with a forward exchange rate contract, a company can enter into an agreement to convert those future cash flows of foreign currency into their local currency at a set rate, thus eliminating its foreign exchange risk.

SAMPLE ANSWER: *The forward exchange rate is what a foreign currency is agreed to be worth at some time in the future. A company can enter into a forward contract on exchange rates to help hedge against exchange rate fluctuations.*

WHAT FACTORS AFFECT FOREIGN EXCHANGE RATES?

- Differences in interest rates
- Differences in inflation
- Budget deficits
- Public debt
- Trade policies
- Capital market equilibrium

WHAT IS THE DIFFERENCE BETWEEN A "STRONG" AND A "WEAK" CURRENCY?

SAMPLE ANSWER: *A strong currency is one with a rising value relative to other currencies. A weak currency is one with a falling value relative to other currencies.*

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Intermediate

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WHAT ARE SOME WAYS THE MARKET EXCHANGE RATE BETWEEN TWO COUNTRY'S CURRENCIES IS DETERMINED?

- The exchange rate may be determined by the interest rates in the two countries:
  - If the interest rate in a foreign country goes up relative to the home country rate, the home currency weakens.
  - When interest rates in a country rise, investments held in that country's currency will earn a higher rate of return and the demand for that country's currency will rise because people will want to invest in that country (all else equal). The rise in demand will cause the currency to strengthen.
  - The exchange rate may be determined by the rates of inflation in the two countries. If inflation in Country A is expected to be higher than that in Country B, Country A's currency will become less valuable (theoretically, all else equal).

SAMPLE ANSWER: *The exchange rate between two countries' currencies is determined by a few factors. One is the interest rates in the two countries. If the interest rate in the home country increases relative to that in the foreign country, demand for the home country's currency tends to increase because investors can get higher rates of return, and increased demand strengthens the home currency. Another factor affecting exchange rates is expectations about inflation in the two countries If one country is expected to experience relatively high inflation, the inflating currency will become less valuable in the long run, all else equal.*

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IF THE U.S. DOLLAR WEAKENS, SHOULD U.S. INTEREST RATES GENERALLY RISE, FALL, OR STAY THE SAME?

- Generally speaking, when the U.S. dollar weakens, interest rates in the U.S. will rise.
- A weak dollar means that the price of imported goods will rise. This means higher inflation and puts pressure on The Fed to raise interest rates.

SAMPLE ANSWER: *Most times, when the U.S. dollar weakens, the price of imported goods will rise, causing higher inflation. This in turn puts pressure on The Fed to raise interest rates. So if the dollar weakens, U.S. interest rates should generally rise.*

IF INFLATION RATES IN THE UNITED STATES FALL RELATIVE TO GREAT BRITAIN'S, WHAT HAPPENS TO THE EXCHANGE RATE?

- If inflation rates in the U.S. become lower than those in Great Britain, then more pounds than dollars will be in circulation.
- When this occurs, a dollar becomes worth more in pounds.
- This means that the dollar strengthens compared to pound.

SAMPLE ANSWER: *If the United States' inflation rate is expected to fall relative to Great Britain's, relatively more pounds will be in circulation and dollars will be worth more pounds. This means that each dollar will cost more pounds than it did before inflation.*

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[Advanced]

Advanced

Below is a chart, which explains the effect of changes in the exchange rate on the earnings of U.S. multinational companies.

Economic Event	Effect on Earnings of U.S. Multinational Companies
U.S. Dollar Strengthens	Negative
U.S. Dollar Weakens	Positive

Below is a chart of the effects of changes in interest rates and inflation rates on the exchange rate of the U.S. dollar.

Economic Event	Effect on Dollar
U.S. Interest Rates Rise	Strengthens
U.S. Inflation Rates Rise	Weakens

WHAT IS THE DIFFERENCE BETWEEN CURRENCY DEVALUATION AND CURRENCY DEPRECIATION?

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SAMPLE ANSWER: *Currency devaluation occurs in a fixed-exchange rate system like China's, when the government arbitrarily alters the exchange rate of its currency. Currency depreciation occurs in a system where currency is allowed to move with the currency exchange market, and the country's currency loses value on that market.*

IF THE SPOT EXCHANGE RATE OF DOLLARS TO POUNDS IS $1.60/£1 AND THE ONE-YEAR FORWARD RATE IS $1.50/£1, WOULD WE SAY THE DOLLAR IS FORECAST TO BE STRONGER OR WEAKER RELATIVE TO THE POUND?

- When the spot exchange rate is higher than the forward exchange rate, the dollar is expected to strengthen.

SAMPLE ANSWER: *Since 1 pound costs more dollars now than it will in the future, the dollar is expected to strengthen in the next year.*

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Basic

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WHAT IS A DERIVATIVE?

SAMPLE ANSWER: *A derivative is a type of investment that derives its value from the value of other assets like stocks, bonds, commodity price, or market index values. Some derivates are futures contracts, forward contracts, calls, puts, etc.*

WHAT ARE OPTIONS?

- **CALL OPTION:** Gives the holder the right to purchase an asset for a specified exercise price on or before a specified expiration date, but does not force them to do so.
    - If you sell a call option and the value of the asset drops below the exercise price (the price the option holder can buy the asset at) then the option is worthless (since they could buy the asset on the open market for a lower price) and you would profit the amount you sold the option for.

- **PUT OPTION:** Gives the holder the right to sell an asset for a specified exercise price on or before a specified expiration date, but does not force them to do so.
    - If you sell a put option and the value of the asset rises above the exercise price (the price the option holder can sell the asset at) then the option is worthless (since they could sell the asset on the open market for a higher price) and you would profit the amount you sold the

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option for.

- **SAMPLE ANSWER:** *Options are derivatives that give the bearer the "option" to buy or sell a security at a given date but without the obligation to do so. The buyer of the option pays an amount less than the actual value of the stock and has the OPTION to buy or sell the stock for a fixed price on or before a specified date.*

WHAT IS HEDGING?

- Hedging is a strategy used by an investor or a company to try to mitigate the risks on an investment. Hedging usually involves investing in derivative products that will be profitable if the market moves in the opposite direction the investor expects. It usually lowers the upside potential return while providing downside protection.

SAMPLE ANSWER: *Hedging is a financial strategy designed to reduce risk by balancing a position in the market. For example, an investor that owns a stock could hedge the risk of the stock going down by buying put options on that security or on related businesses in the same industry.*

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WHAT ARE FORWARD CONTRACTS?

- A forward is an agreement that calls for future delivery of an asset at an agreed-upon price.
- Forwards are similar to forward currency exchange contracts and are used in a similar fashion, but they are typically contracts for goods rather than for currencies.
- No money is exchanged initially. Forwards are designed to protect the parties from future price fluctuations.

SAMPLE ANSWER: *A forward contract is a type of derivative that arranges for the future delivery of an asset (oil, grain, currencies, etc) on a specific date at an agreed price.*

WHAT ARE FUTURES CONTRACTS?

- Futures contracts are almost the same as forward contracts, except that they are strictly defined quantities of certain products that are traded publicly.

SAMPLE ANSWER: *Futures are a financial contract obligating the buyer to purchase an asset such as a commodity or another financial instrument at a specified price on a specified date. Futures have very strictly defined terms and are traded publicly on the exchanges.*

WHAT IS THE MAIN DIFFERENCE BETWEEN FUTURES CONTRACTS AND FORWARD CONTRACTS?

- There are a few slight differences between futures and forwards.
- Futures are traded on exchanges; forwards are traded over-the-counter.
- Futures are highly standardized, which is why they can be traded on exchanges.
- Forwards are privately negotiated, can be customized to the satisfaction of the parties, and can be revised throughout their duration with the consent of the parties.

SAMPLE ANSWER: *Futures are highly standardized in all their terms so as to be traded publicly on the exchanges. Forwards are privately negotiated, customizable contracts that can be revised to suit the buyer and seller, which is why they must be traded over the counter.*

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[Intermediate]

Intermediate

WHAT FACTORS INFLUENCE THE PRICE OF AN OPTION?

- Factors affecting option prices include current stock price, exercise price, volatility of the stock, time to expiration, interest rate, and dividend rate of the stock.
- Below is a chart of how these factors influence the price of an option.
- Look for online option pricing calculators you can play with to see how each variable affects the price.

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Increasing Variable	Effect on Call Option Price	Effect on Put Option Price
Current Stock Price	Price Increases	Price Decreases
Exercise/Strike Price	Price Decreases	Price Increases
Volatility	Price Increases	Price Increases
Time to Expiration	Price Increases	Price Increases
Interest Rate	Price Increases	Price Decreases
Dividend Payout	Price Decreases	Price Increases

IF AN OPTION IS "IN THE MONEY" WHAT DOES THAT MEAN?

- An option is "in the money" when exercising the option will result in a profit.
- A call option is in the money when its exercise price is below the market price, since an investor can purchase the asset at the exercise price and immediately sell it at the (higher) market price.
- A put option is in the money when its exercise price is above the market price, since an investor

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can buy the asset at the market price and immediately sell it at the (higher) exercise price.

SAMPLE ANSWER: *When an investor exercises an option that is "in the money," the difference between the exercise price and the market price will create value. A call option is in the money if the exercise price is below the market price and a put option is in the money when its exercise price when it is above the market price.*

WHAT ARE SWAPS?

- A swap is an agreement between companies that they will exchange future cash flows for a period of time. A swap can be an exchange of interest rates, currency exchange rates, etc.
- Swaps can benefit both companies if one has access to a lower floating rate, and one has access to a lower fixed rate, and each desires the other company's rate.

SAMPLE ANSWER: *A swap is an agreement to exchange future cash flows for a set period. The best known recent "swap" has been the credit default swaps issued by banks as a kind of insurance against companies not being able to repay their debt.*

SUPPOSE YOU HOLD A PUT OPTION ON MICROSOFT STOCK WITH AN EXERCISE PRICE OF $60. THE EXPIRATION DATE IS TODAY, AND MICROSOFT IS TRADING AT $50. ABOUT HOW MUCH IS YOUR PUT WORTH AND WHY?

SAMPLE ANSWER: *This put is worth $10. It gives you the option to sell your shares at $60, and you can buy them in the open market at $50. You therefore would buy shares of Microsoft at $50 per share and immediately sell them for $60, making a profit of $10 per share.*

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[Advanced]

Advanced

ALL ELSE BEING EQUAL, WHICH WOULD BE LESS VALUABLE: A DECEMBER PUT OPTION ON A SMALL CAP TECH STOCK OR A DECEMBER PUT OPTION ON A LARGE CAP HEALTHCARE STOCK?

SAMPLE ANSWER: *The put option on the healthcare stock would usually be less valuable because the healthcare industry and large cap stocks in general are usually less volatile than small cap tech stocks. The more volatile the underlying asset, the more valuable the option on the stock.*

ALL ELSE BEING EQUAL, WHICH WOULD BE MORE VALUABLE: A DECEMBER CALL OPTION FOR APPLE OR A JANUARY CALL OPTION FOR APPLE?

SAMPLE ANSWER: *The January option would be more valuable because the later an option expires, the more valuable it is.*

WHY DO INTEREST RATES MATTER WHEN FIGURING THE PRICE OF OPTIONS?

SAMPLE ANSWER: *Interest rates matter due to net present value. A higher interest rate lowers an option's value because the PV of that option will be lower.*

WHAT IS THE BLACK-SCHOLES MODEL?

- The Black-Scholes model is a way to value asset options (puts and calls).
- The model contains a few equations and is quite complicated. (Don't freak out when you see the formulas; if you needed to use them, your employer would have a program where you simply

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plug in the variables and it does the work for you!)

- The equations of the Black-Scholes Model are listed here for reference, but more important is to remember that the model has 6 inputs:
  - S = Current price of the asset
  - K = Exercise or strike price of the option
  - t = Time until expiration of the option (years)
  - r = Risk free rate (%)
  - ? = The Volatility of the Stock's Returns (%)
  - d = Dividend yield (%)

EQUATIONS OF THE BLACK-SCHOLES MODEL

- $Price\ of\ A\ Call\ Option\ C(S,t) = SN(d_1) - Ke^{-r(t)}N(d_2)$
- $Price\ of\ a\ Put\ Option\ P(S,t) = Ke^{-r(t)} - S + (SN(d_1) - Ke^{-r(t)}N(d_2))$
- $d_1 = \frac{\ln\left(\frac{S}{K}\right)+\left(r+\frac{\sigma^2}{2}\right)t}{\sigma\sqrt{t}}$
- $d_2 = d_1 - \sigma\sqrt{t}$

- After giving your summary answer (next bullet), be ready to answer follow-up questions like those that below about the definitions of the variables and the effect of an increase or decrease in any of the variables.

- If you are applying for a trading job or heavily quant-focused position, you should do additional research on the Black-Scholes model so you are more comfortable speaking about it in depth.

SAMPLE ANSWER: *The Black-Scholes model is the industry standard for pricing options. The formula is pretty complicated, with 6 inputs that affect the price. They are the current price of the asset, the exercise price of the option, the time until expiration, the current risk free rate, the asset's variance, and the dividend*

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yield.

WHAT IS ALPHA?

SAMPLE ANSWER: *Alpha is the risk-adjusted performance of an investment. It represents the return in excess of the return expected for the risk of the investment.*

If **Alpha > 0**	The investment has returned more than expected for its level of risk
If **Alpha = 0**	The investment has returned the appropriate amount for its level of risk
If **Alpha < 0**	The investment has returned less than expected for its level of risk

WHAT IS BETA?

- Beta is the volatility of an investment compared with the market as a whole; it is used in the CAPM (Capital Assets Pricing Model) formula to determine the appropriate cost of equity.
- Beta is calculated using a regression of past returns compared to the returns of the market as a whole but can also be found on sources like Bloomberg, Yahoo! Finance, etc.
- Large, stable stocks tend to have a Beta less than one, while smaller, riskier stocks tend to have higher Betas.

SAMPLE ANSWER: *Beta is the volatility of a given investment compared to the volatility of the market as a whole. Large, stable stocks tend to have a lower beta while smaller, riskier stocks tend to have a higher beta.*

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Beta = 1.5	If the market rises 10%, the investment should rise 15%
Beta = 1	If the market rises 10%, the investment should rise 10%
Beta = 0.5	If the market rises 10%, the investment should rise 5%
Beta = 0	The investment moves completely independently of the market
Beta = -1	If the market rises 10%, the investment should fall 10%

Company	Equity Beta
Apple	1.13
Microsoft	1.09
Amazon	1.83
Walmart	0.46

WHAT WOULD YOU EXPECT TO HAVE A HIGHER BETA: A SMALL-CAP TECHNOLOGY COMPANY OR A LARGE-CAP MANUFACTURER?

SAMPLE ANSWER: *A small cap technology company is expected to be a riskier investment than a large manufacturing company. Therefore, all else equal, the technology company should have a higher beta.*

WHAT IS DELTA?

- Delta is the relationship between the price of an option/derivative and the price of the underlying security.
- If a call option has a Delta of 0.5, then if the price of the stock rises by $1.00, the price of the option will rise by $0.50.

WHAT IS GAMMA?

- Gamma is the first derivative of Delta and is used to gauge the price of an option relative to how far in or out of the money it is.
- When an option is well i or well out of the money, Gamma is very large; but when the option is on the verge of being in or out of the money Gamma is very small.

WHAT IS RHO?

- Rho measures the sensitivity of a derivative's price in relation to fluctuations in the risk-free interest rate.
- If a derivative has a Rho of 10, every one-point rise in interest rates will be accompanied by a

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10%rise in the price of the derivative.

WHAT IS THETA?

- Theta measures how quickly a derivative's price will decline with the passage of time, as the instrument approaches its exercise date (Time Decay).
- All else equal, the shorter the time to expiration of a derivative, the lower the option's value.

WHAT IS VEGA?

- Vega is a measure of how much a derivative's price will move with a 1% change in volatility of the market.
- A more volatile market makes derivatives more valuable, therefore if Vega is high, the instrument's value will increase significantly as the market becomes more volatile.

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Why is implied volatility of out of the money options higher?

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Basic Concepts, Questions, and Case Studies

Basic Concepts, Questions, and Case Studies

WHAT ARE SOME REASONS THAT TWO COMPANIES WOULD WANT TO MERGE?

- Synergies
- New market presence
- Consolidate operations
- Gain brand recognition
- Grow in size (market share, economies of scale, economies of scope)
- Vertical or horizontal integration (integrating either a supplier, vendor, or competitor into the purchasing company's operations)
- Taxation (a company can obtain a non-profitable company's tax asset by purchasing it)
- Diversification of product offerings
- Gain patents, plant, equipment, intellectual property
- Management ego and the desire to run a larger company and increase their own compensation

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SAMPLE ANSWER: *The main reason two companies would want to merge would be the synergies the companies should create by combining their operations. However, some other reasons include gaining a new market presence, an effort to consolidate their operations, gaining brand recognition, growing in size, or gaining the rights to some property (physical or intellectual) that they couldn't gain as quickly by creating or building it on their own.*

WHAT ARE SOME REASONS TWO COMPANIES WOULD NOT WANT TO MERGE?

- The "synergies" they are looking to gain through the merger simply will not occur.
- Many times, mergers are more about boosting a management team's ego and growing the business in order to gain the marketability and media attention of a merger.
- Investment banking fees associated with going through a merger.
- Often the synergies that a company hopes to gain by going through with a merger don't materialize. Additionally, a company may also be enticed to do a merger due to management ego and/or wanting to gain media attention. Finally, the investment banking fees associated with completing a merger can be prohibitive.
- The amount of debt capital needed to help fund the transaction could result in an unsustainable capital structure (i.e. too much annual interest expense to pay, or the amount of time the company has to pay off the principal may not be long enough if merger integration takes an extended period of time).

WHAT DO BANKERS DO DURING A SELL-SIDE M&A DEAL?

- In a sell-side deal, the bank will market a company to potential buyers and then helps both sides negotiate the deal and complete the sale process. There are four main steps. First, the bank will meet with the company and put together informational documents such as an offering memorandum, which will help market the company for sale to potential buyers. Next, the bank will create a list of potential buyers and send out an executive summary to measure interest in the deal, following up with additional information if requested. Next, the bank will set a deadline for prospective buyers to submit an indication of interest, which narrows down the group. The bank will select the prospective buyers who submit acceptable indications of interest, and

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continue to send them additional information. Finally, the bank will work with the company to maximize the purchase price (or the certainty of a transaction closing), select the winning bidder and help to negotiate the terms, finalize documentation and then announce the deal.

WHAT DO BANKERS DO DURING A BUY-SIDE M&A DEAL?

SAMPLE ANSWER: *In a buy-side deal, the bank will go out and search for potential companies for their client to acquire and negotiate the deal to obtain the lowest price possible. There are four main steps. The first will be to do a lot of research on a very large number of potential acquisition targets based on what the client has represented that they are looking for. After sharing the initial list with the client, you will cut the list down based on their feedback and decide which targets to approach about being purchased. After having meetings with each of them, you decide which to pursue further based on how open they are to the idea of an acquisition. The third step is to do further due diligence on each of the targets which are open to acquisition while further narrowing down the list and coming up with an offer price for each of the targets. Finally, you work with the client to select the final target and work to negotiate and structure the deal and announce the transaction.*

WHAT ARE SYNERGIES?

- Synergies are improvements that result from the combination of two companies. The idea is that the combined company can generate a higher EPS than the two standalone businesses could.
- The value of the combined company will be greater than simply adding the two together.
- Synergies can result for many reasons including cost cuts due to reduction in redundant management, employees, offices, etc. There are also sometimes revenue synergies due to the freedom to raise prices because of reduced competition, cross-marketing, economies of scale, etc.

SAMPLE ANSWER: *The concept of synergies is that the combination of two companies results in a company that is more valuable than the sum of the values of the two individual companies coming together. The reasons for synergies can be either cost-saving synergies like cutting employees, reduction in office size, etc or it can include revenue-generating synergies such as higher prices and economies of scale.*

WHICH WILL NORMALLY PAY A HIGHER PRICE FOR A COMPANY, A STRATEGIC BUYER OR A FINANCIAL BUYER?

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SAMPLE ANSWER: *A strategic buyer will normally pay a higher price due to their willingness to pay a premium for the synergies of lowering costs, improving the existing business, and/or revenue synergies. The financial buyer typically looks at the company purely in terms of returns on a standalone basis unless they have other companies in their portfolio that could significantly improve operations of the target.*

WHAT IS THE DIFFERENCE BETWEEN A STRATEGIC BUYER AND A FINANCIAL BUYER?

- **STRATEGIC BUYER:** A corporation that wants to acquire another company for strategic business reasons such as synergies, growth potential, etc. An example of this would be an automobile maker purchasing an auto parts supplier in order to gain more control of their COGS and keep costs down.
- **FINANCIAL BUYER:** A group looking to acquire another company purely as a financial investment. An example is a private equity fund doing a leveraged buyout of the company.

SAMPLE ANSWER: *Strategic buyers and financial buyers are very different. A strategic buyer is usually a company looking to buy another company in order to enhance the business strategically, through cost cutting, synergies, gaining property, etc. A financial buyer is traditionally a group of investors, such as a private equity firm, buying a company purely as an investment, looking to generate a return for their investors and carry for the fund.*

WHAT IS A FAIRNESS OPINION?

- A fairness opinion is a report evaluating the facts of an M&A transaction. The report is typically prepared by a qualified investment bank to examine the "fairness" of a given transaction.

WALK ME THROUGH A MERGER MODEL

- In a merger model, you start by projecting the financial statements of the Buyer and Seller. Then, you estimate the Purchase Price and the mix of Cash, Debt, and Stock used to fund the deal. You create a Sources & Uses schedule and Purchase Price Allocation schedule to estimate the true cost of the acquisition and its effects.
- Then, you combine the Balance Sheets of the Buyer and Seller, reflecting the Cash, Debt, and Stock used, new Goodwill created, and any write-ups. You then combine the Income Statements,

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reflecting the Foregone Interest on Cash, Interest on Debt, and synergies. If Debt or Cash changes over time, your Interest figures should also change.

- The Combined Net Income equals the Combined Pre-Tax Income times (1 – Buyer's Tax Rate), and to get the Combined EPS, you divide that by the Buyer's Existing Share Count + New Shares Issued in the Deal.
- You calculate the accretion/dilution by taking the Combined EPS, dividing it by the Buyer's standalone EPS, and subtracting 1.

WHAT ARE THE PRIMARY TOOLS A PRIVATE EQUITY INVESTOR CAN TAKE TO INCREASE THE VALUE OF HIS/HER INVESTMENT WITH A TYPICAL LBO TRANSACTION STRUCTURE?

SAMPLE ANSWER: *Private Equity investors make money on their investments in private companies by increasing the value of the equity (not to be confused with Enterprise Value) in the portfolio company. In order to increase the equity value of a portfolio investment, a Private Equity investor can take at least one of the following strategies:*

1. *Improve operations of the business such that EBITDA (and EBITDA margins) expand. This could be achieved through headcount rationalization (i.e. laying off workers), business process improvements (for example, through investments in scalable technologies), or expansion into alternative markets from both a product and regional perspective*
2. *Pay down debt through the cash flow generated internally through the operations of the business. This comes hand in hand with operational improvement, but even before a company makes operational improvements, a PE investor will want to see that the company has a strong track record of generating positive free cash flow. That way, even if operational improvement initiatives prove to be unsuccessful, the company still has the ability to pay off the debt used to fund the initial buyout (which will increase the equity value of the business, all else equal).*
3. *Multiple expansion – this is a market-based approach that is centered around selling the company for a higher multiple of EBITDA than it was originally purchased for. This is often out of the control of the PE investor, unless that investor has incredible market timing and can identify when a company may be trading at a relatively low EBITDA multiple (for the purposes of making the investment) and at a relatively high EBITDA multiple (for the purposes of selling, or exiting, the investment).*

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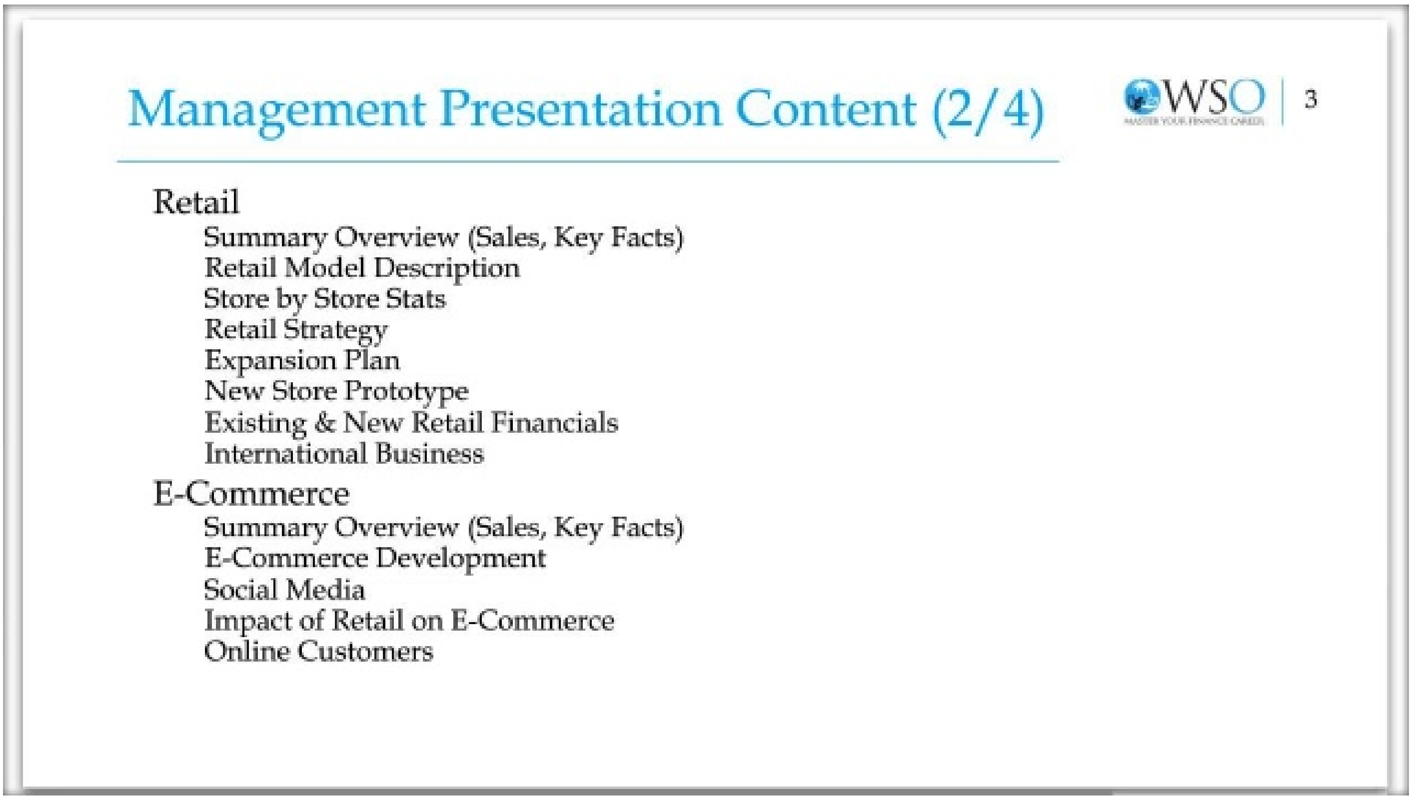
IB Deal Walkthrough: Growth Capital Transaction Overview



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IB M&A Case: Different M&A Transaction Structures

IKEA's Balance Sheet

15

Consolidated Balance Sheet	2017	2016
Intangible Fixed Assets	8,243	8,932
Tangible Fixed Assets	1,451	1,336
Financial Fixed Assets	246	322
Total Fixed Assets	**9,940**	**10,590**
Inventories	3,998	4,284
Receivables	4,435	3,783
Cash and Cash Equivalents	284	302
Total Current Assets	**8,717**	**8,369**
Total Assets	**18,657**	**18,959**
Group Equity	**4,194**	**4,258**
Provisions	497	538
Non-current Liabilities	7,861	8,601
current liabilities	6,105	5,532
Total Liabilities	**14,463**	**14,701**
Equity and Liabilities	**18,657**	**18,959**

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What are Some Common Anti-Takeover Techniques?

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Intermediate Concepts, Questions, and Case Studies

Intermediate Concepts, Questions, and Case Studies

CAN YOU NAME TWO COMPANIES THAT YOU THINK SHOULD MERGE?

- This is another question testing your awareness of what is going on in the markets. There is no right or wrong answer to this question, just have in mind two companies that you believe would benefit from merging, and have a well formulated rationale for a the merger (think synergies, gain foothold in a new market, consolidation of operations, or brand recognition).
- The important part of your answer to this question is that the two companies you choose make sense as a combined entity, and you have several logical reasons why.

WHAT IS A STOCK SWAP?

- A stock swap is when the acquired company agrees to be paid in stock of the new company because they believe in the potential for success in the merger.
- Stock swaps are more likely to occur when the stock market is performing well and the stock price of the acquiring firm is relatively high, giving them something of high value to trade.

SAMPLE ANSWER: *A stock swap is when a company purchases another company by issuing new stock of the combined company to the former owners of the company being acquired, rather than paying in cash.*

WHAT IS THE DIFFERENCE BETWEEN SHARES OUTSTANDING AND FULLY DILUTED SHARES?

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SAMPLE ANSWER: *Shares outstanding represent the actual number of shares of common stock that have been issued as of the current date. Fully diluted shares are the number of shares that would be outstanding if all "in the money" options were exercised.*

HOW DO YOU CALCULATE THE NUMBER OF FULLY DILUTED SHARES?

- The most common way of calculating the number of fully diluted shares is the treasury stock method.
- This method involves finding the number of current shares outstanding, adding the number of options and warrants that are currently "in the money," and then subtracting the number of shares that could be repurchased using the proceeds from exercising the options and warrants.

SAMPLE ANSWER: *The most common way of determining the number of fully diluted shares is the treasury stock method.*

NOTE: More information on the treasury stock method is included later in this course.

WHAT IS A CASH OFFER?

SAMPLE ANSWER: *A cash offer is payment in cash for ownership of a corporation. The other form of consideration a buyer may use to fund a transaction is with stock of the acquiring company.*

WOULD I BE ABLE TO PURCHASE A COMPANY AT ITS CURRENT STOCK PRICE?

SAMPLE ANSWER: *Due to the fact that purchasing a majority stake in a company will require paying a control premium, most of the time a buyer would not be able to simply purchase a company at its current stock price.*

WHY PAY IN STOCK VERSUS CASH?

SAMPLE ANSWER: *If a company pays in cash, those receiving it will have to pay taxes on it. Additionally, if the owners of the company being acquired want to be a part of the new company, they may prefer stock if they believe the new company will perform well and the stock will increase in value. Current market performance may also affect the stock/cash decision. However, if the market is performing poorly, or is highly volatile, the company being acquired may prefer cash for the stability it provides.*

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ALL ELSE EQUAL, HOW WOULD ONE COMPANY PREFER TO PAY FOR ANOTHER?

SAMPLE ANSWER: *Since cash is the cheapest source of capital, it would be the preferred way to purchase another company if the purchaser had sufficient cash. On the other hand, a company wanting to keep a significant cash buffer would prefer other ways of financing the transaction. If a company feels its stock price is inflated, it would prefer to use that to pay for the acquisition. In short, the preferred means of payment always depends upon the circumstances of the acquisition, the company, and the market.*

IF YOU OWNED A SMALL BUSINESS AND A LARGER COMPANY CAME TO YOU OFFERING AN ACQUISITION, HOW WOULD YOU THINK ABOUT THE OFFER AND WHETHER OR NOT TO TAKE IT?

- Obviously, the higher the price the better, but there are a couple other things to think about as well. Are you getting paid in cash or stock? Cash is great because it is tangible and you can spend it now, but you also pay taxes on it right away. Stock you only pay taxes on when you sell and your stock can be worth more if the acquirer increases in value. However, this can also work the opposite way if the acquirer falls in value. Also think about what the acquirer's plans are for you as an owner. Are you going to continue running the business? Do you want to? The answer to these questions all depends on your personal preferences and what stage of life you are at.

WHAT IS A TENDER OFFER?

- A tender offer occurs during a takeover, when the acquirer offers to purchase the shareholders' stock, usually at a higher price than the market, in an attempt to gain controlling interest in a company.

- Some tender offers may be hostile. In a hostile tender offer, Company A wants to acquire Company B, but B refuses. Company A therefore issues a tender offering. When this occurs, Company A will run advertisements in newspapers to buy stock of B at a price above the market price. For example, Company A will offer to pay $30 for shares currently trading at $15 in an attempt to gain ownership of more than 50% of the stock and take ownership of the business as a whole.

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SAMPLE ANSWER: *A tender offer is often a hostile takeover technique. It occurs when a company or individual offers to purchase the stock of the target company for a price usually higher than the current market price in an attempt to take control of the company without management approval.*

DESCRIBE A RECENT M&A TRANSACTION YOU HAVE READ ABOUT.

SAMPLE ANSWER: *This is similar to the recent IPO question. It is simply to explore your general interest in the markets. Look in The Wall Street Journal, Financial Times or dealbook.blogs.nytimes.com to get information about recent M&A transactions. Know the companies involved, the price and multiples paid, whether it was a merger or an acquisition, and the banks working on the deal. Also know the primary reasons behind the M&A transaction.*

IF COMPANY A PURCHASES COMPANY B, WHAT WILL THE COMBINED COMPANY'S BALANCE SHEET LOOK LIKE?

SAMPLE ANSWER: *The new Balance Sheet will be simply the sum of the two companies' Balance Sheets plus the addition of "goodwill," which would be an intangible asset, to account for any premium paid on top of Company B's actual assets.*

WHAT IS THE DIFFERENCE BETWEEN GOODWILL AND OTHER INTANGIBLE ASSETS?

- Goodwill is normally the markup in a company's value through a merger or acquisition. With current accounting standards, goodwill is not amortized and is written down only if there is a goodwill impairment or another acquisition.

- Other intangible assets are assets that are not physical but are amortized over a set period of time. Since amortization is an expense, it will affect the Income Statement (reducing net income). Additionally, as the asset amortizes, its carrying amount on the Balance Sheet will go down by the amount of the amortization.

SAMPLE ANSWER: *Goodwill and other intangible assets are similar in nature in that they are both non-physical assets carried on a company's Balance Sheet. The main difference between the two is that goodwill is only reduced in the event of a goodwill impairment or acquisition, whereas other intangible assets are amortized over a fixed number of years.*

WHAT IS A DIVESTITURE?

SAMPLE ANSWER: *A divestiture is a transaction when a company sells off a certain business segment or division. It's like a normal sell-side M&A deal, but rather than the bank looking to sell the entire company, its only looking to sell a certain piece. The bankers still gather information about the division, then prepare a list*

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of suitable buyers for that division or segment, and work with the client to pick the best acquirer and maximize the selling price. The process tends to be a bit more complicated since the bankers need to put together all of the information and financials for that division alone, which may not be as easy to come by as those for the entire business.

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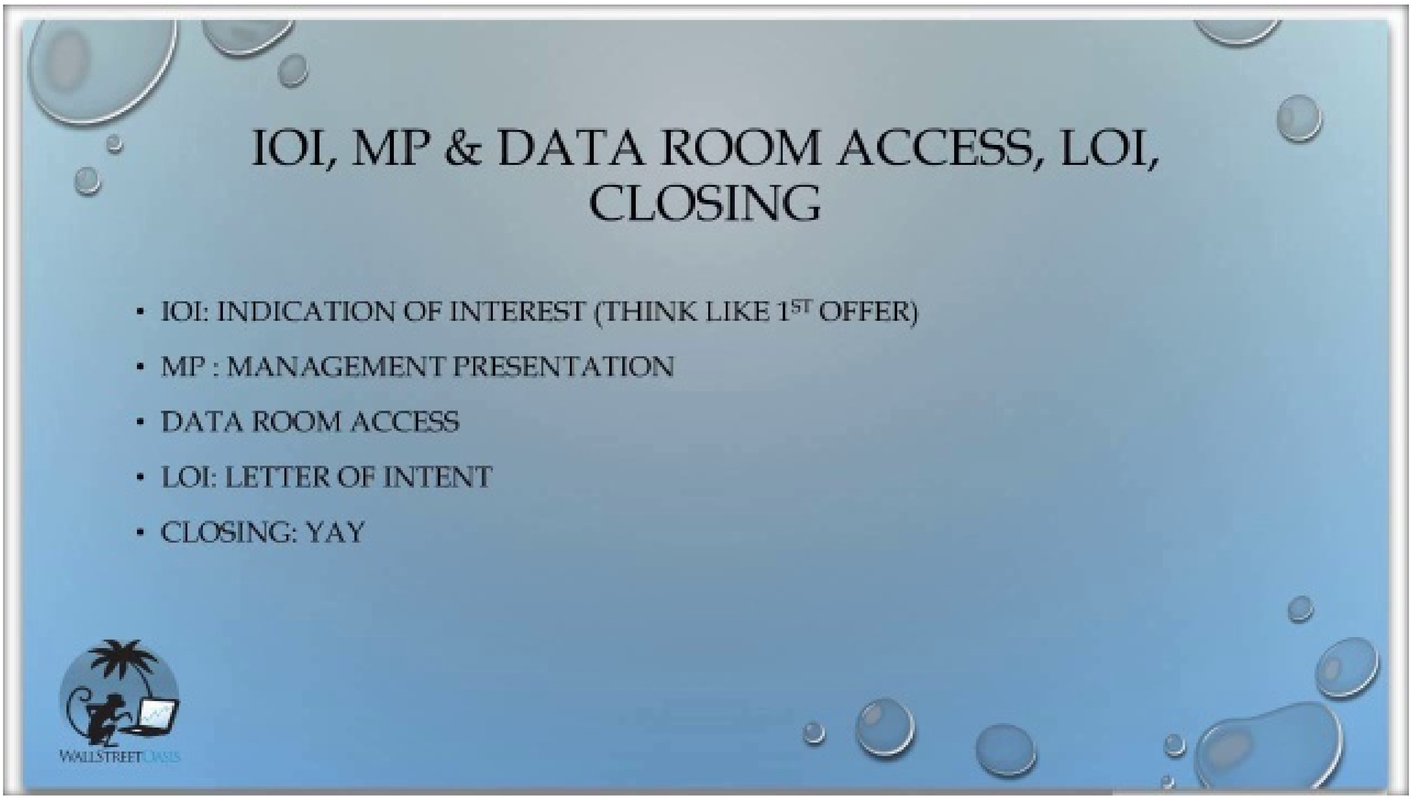
IB Deal Walkthrough: Full Sell-Side Transaction



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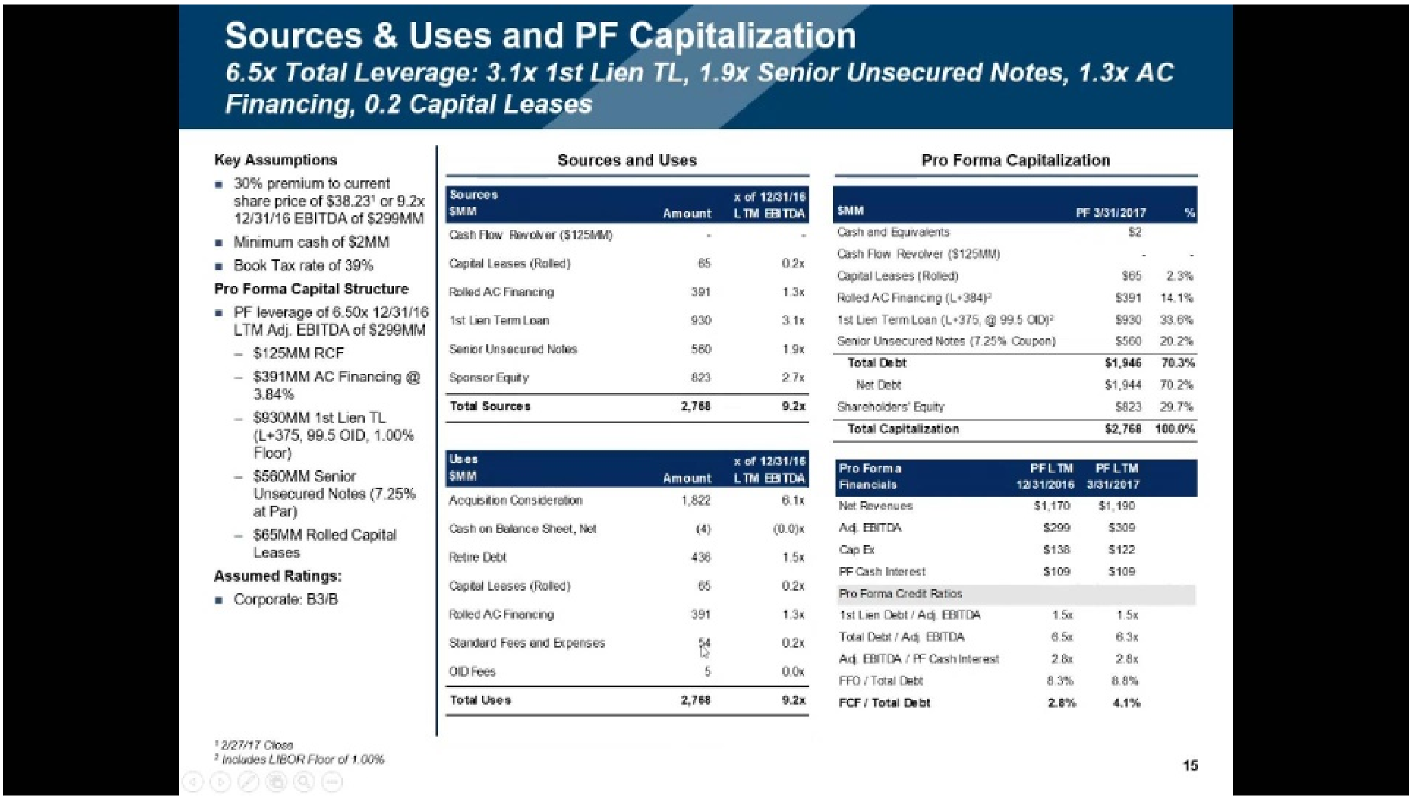
IB Deal Walkthrough: Public Company Takes Private LBO



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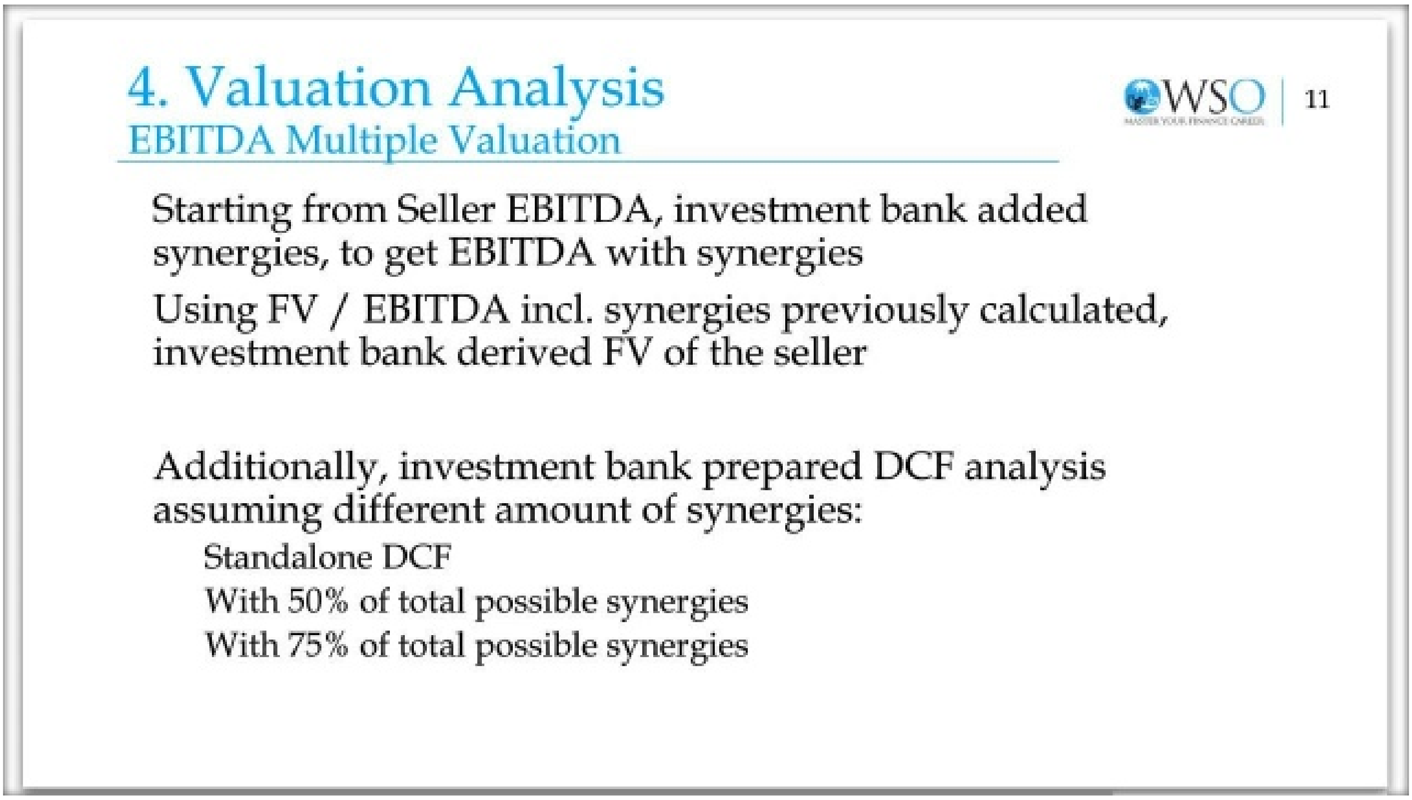
IB Deal Walkthrough: Buyers' Ability to Pay in a Sell-Side



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Advanced Concepts, Questions, and Case Studies

Advanced Concepts, Questions, and Case Studies

WHAT IS THE DIFFERENCE BETWEEN AN ACCRETIVE MERGER AND A DILUTIVE MERGER, AND HOW WOULD YOU GO ABOUT FIGURING OUT WHETHER A MERGER IS ACCRETIVE OR DILUTIVE?

- A deal is accretive if the extra Pre-Tax Income from a Seller exceeds the cost of the acquisition in the form of Foregone Interest on Cash, Interest Paid on New Debt, and New Shares Issued. For example, if the Seller contributes $100 in Pre-Tax Income, but the deal costs the Buyer only $70 in Interest Expense, and it doesn't issue any new shares, the deal will be accretive because the Buyer's Earnings per Share (EPS) will increase. A deal will be dilutive if the opposite happens. For example, if the Seller contributes $100 in Pre- Tax Income but the deal costs the Buyer $130 in Interest Expense, and its share count remains the same, its EPS will decrease.
- Take a look at another example:
  - Company A acquires Company B. Company A has $5 million in earnings, 1 million shares outstanding, and earnings of $5 per share. Company B has earnings of $1 million.
  - If Company A's EPS Pre-Deal > Company A's EPS Post-Deal, the deal is dilutive.
  - If Company A's EPS Pre-Deal < Company A's EPS Post-Deal, the deal is accretive.

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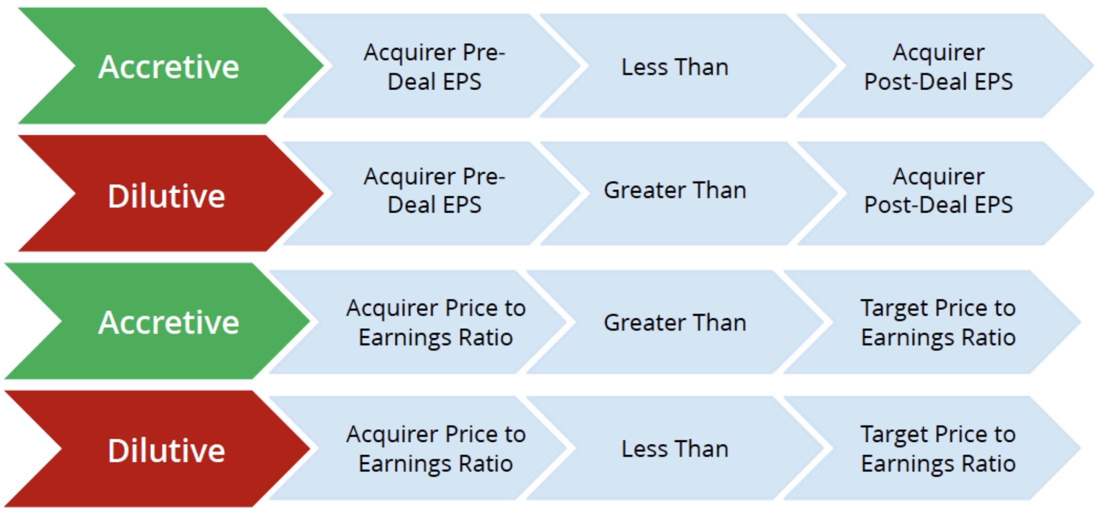
- Whether the deal is accretive or dilutive depends on how much Company A pays for Company B, and how payment is made.

- For example, if Company A has a large amount of cash on hand, it may decide not to issue any new stock and simply pay cash for the Company B. In this case, the deal is accretive since earnings will increase to $6 million, with the same 1 million shares of stock, resulting in EPS of $6. However, if Company A decides to issue another million shares in a stock swap transaction, EPS will decrease since earnings will be $6 million with 2 million shares outstanding, meaning EPS is now only $3.

- A quick and easy way to figure out whether a deal will be accretive or dilutive is to use the respective P/E ratios of the firms in the transaction. If Company A has a higher P/E ratio than Company B, the merger will be accretive. If Company B has the higher P/E ratio, the deal will be dilutive because the acquirer will pay less for the target per dollar of earnings.



SAMPLE ANSWER: *An accretive merger is one in which the acquiring company's earnings per share will increase following the acquisition. A dilutive merger is one in which the opposite occurs. The quickest way to figure out is a merger is accretive or dilutive is to look at the P/E ratios of the firms involved in the transaction. If the acquiring firm has a higher P/E ratio than the firm it is purchasing, the merger will be accretive because the acquirer will pay less per dollar of earnings for the target company than where the*

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target's stock is currently trading.

COMPANY A IS CONSIDERING ACQUIRING COMPANY B. COMPANY A'S P/E RATIO IS 50 TIMES EARNINGS, WHEREAS COMPANY B'S P/E RATIO IS 20 TIMES EARNINGS. AFTER COMPANY A ACQUIRES COMPANY B, WILL COMPANY A'S EARNINGS PER SHARE RISE, FALL, OR STAY THE SAME?

SAMPLE ANSWER: *Since the P/E of the firm doing the purchasing is higher than that of the firm it is purchasing, the new company's EPS will be higher, therefore creating an accretive merger.*

WALK ME THROUGH THE BASICS OF A MERGER MODEL? (AKA AN ACCRETION DILUTION MODEL)

- First step in this method is to make an assumption around how much it costs to acquire the company and how the acquisition would be financed (cash, debt or stock).
- Second step is to create a projection model of both the buyer and seller's income statements from revenue down to net income.
- The next step is to combine the income statements. You do this by adding together each of the individual line items.
- Keep in mind that you do need to make a few slight adjustments. If the acquisition was financed with debt, you have to add the additional amount of interest that would be paid on the new debt to the net interest expense line. If it is financed with cash, you need to subtract the interest you would have earned on that cash (interest income) from the net interest line. If it was financed by issuing new shares, you must increase the share count.
- The last step is to apply the buyer's tax rate to pretax net income to get the net income of the combined company and then divide that number by the new number of shares outstanding to arrive at the new EPS number and see if the transaction is accretive or dilutive.

WHY DO PEOPLE FOCUS SO HEAVILY ON EPS WHEN EVALUATING A POTENTIAL MERGER?

- Because it's the only easy-to-calculate metric that also captures the FULL impact of the deal – the Foregone Interest on Cash, Interest on New Debt, and New Shares Issued. Although metrics

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such as EBITDA and Unlevered FCF are better in some ways, they don't reflect the deal's full impact because they exclude Interest and the effects of new shares.

ARE THERE CASES WHERE EPS ACCRETION/DILUTION IS NOT IMPORTANT?

- Yes, for example, if the buyer is private or it has negative EPS, it won't care about whether the deal is accretive or dilutive. It also makes little difference if the Buyer is far bigger than the Seller (e.g., 10x –100x its size). Besides EPS accretion/dilution, you can also analyze the qualitative merits of the deal, compare the IRR to the Discount Rate, and value the Buyer before and after the deal. Finally, you can create a Contribution Analysis where you look at how much the Buyer and Seller "contribute" to each financial metric and then base the ownership of the Combined Company (and, therefore, the purchase price) on that.

WHAT IS THE TREASURY STOCK METHOD?

- The treasury stock method is a way of estimating the effects of employee stock options as well as convertible debt and preferred stock to calculate the number of "fully diluted shares outstanding."
- It is mainly used to estimate diluted EPS numbers.
- First, you must assume that those holding options that are in the money will exercise them.
- Also assume that all proceeds generated from the exercise of options will be used to repurchase company stock at the current price.
- Here is the methodology:
    - Begin with the company's common shares outstanding. This can be found in its most recent 10-K or 10-Q. For this example, assume there are 1,000,000 shares outstanding.

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- Then go to the 10-K or 10-Q and find the options chart. The options that will be exercised are those with a weighted average exercise price below the current market price. Assume there are 100,000 shares with a W.A.E.P. of $5 and the stock is selling for $10 currently.
- This means that 100,000 new shares of stock will be issued, and the company will profit $500,000 from the sale of those shares. Now there will be 1,100,000 shares.
- That $500,000 profit will then be used to repurchase shares in the open market at $10 per share.
- The company will repurchase 50,000 shares, meaning there will be 1,050,000 shares after the exercise of the options.

SAMPLE ANSWER: *The treasury stock method is a way of calculating a hypothetical number of shares outstanding based on current options and warrants that are currently "in the money." The methodology involves adding the number of "in the money" options and warrants to the number of common shares currently outstanding, and then assuming all the proceeds from exercising the options will go towards repurchasing stock at the current price.*

IF A COMPANY HAS 1,000 SHARES OUTSTANDING AT $5 PER SHARE AND ALSO HAS 100 OPTIONS OUTSTANDING AT AN EXERCISE PRICE OF $2 PER SHARE, WHAT IS THE COMPANY'S FULLY DILUTED EQUITY VALUE?

- The answer below is correct if the exercise price is below the current price, meaning that the options can be assumed to be exercised. However, if the exercise price in this example were $10 per share, you would assume that the options are not exercised and therefore have no effect on Equity Value.

SAMPLE ANSWER: *Since there are 1,000 shares at $5 each, the current market cap would be $5,000. Since all the options are in the money because the exercise price is below the current price, you assume they are exercised. This means that there will be 1,100 shares in the market and another $200 ($2 exercise price x 100 options) given to the company. That $200 is assumed to be used to buy back 40 shares ($200/$5 current price), leaving 1,060 shares in the market, at a price of $5 per share, making Equity Value $5.3K.*

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ARE MOST MERGERS STOCK SWAPS OR CASH TRANSACTIONS AND WHY?

SAMPLE ANSWER: *This varies. In strong markets many mergers are stock swaps mainly because the prices of company stock are so high, but also because the current owners may desire stock in the new company as they anticipate further growth in a strong market.*

YOU ARE ADVISING A CLIENT IN THE POTENTIAL SALE OF A COMPANY. WHO WOULD YOU EXPECT TO PAY MORE FOR THE COMPANY: A COMPETITOR OR AN LBO FUND?

SAMPLE ANSWER: *If the competitor is a strategic buyer, you would expect the competitor to pay more for the company. A strategic buyer would derive additional benefits (synergies) and therefore higher cash flows from the purchase than would an LBO fund, which is traditionally a financial buyer.*

WHAT IS A LEVERAGED BUYOUT? HOW IS IT DIFFERENT FROM A MERGER?

- An LBO is when a group, usually a private equity firm, purchases a company using a relatively high amount of financial leverage, meaning the purchase is financed using mostly debt, with a relatively low equity investment. Ideally, the company then pays off the debt over the investment horizon using the cash flow from the business. Over the course of the investment, the capital structure changes from a high percentage of debt to a high percentage of equity.
- For example, a PE firm purchases a company for $100mm, using $20mm in equity and $80mm in debt. Over the course of 5 years, they pay off the debt using the company's cash flow. Even if the company's Enterprise Value does not increase over the 5 years, if the firm now sells the company for$100mm, the fund would have returned $120mm ($100mm sale price plus $20mm dividend from excess cash flows) on a $20mm investment, a healthy return.

SAMPLE ANSWER: *Essentially, an LBO takes place when a fund wants to buy a company using more debt than cash with the intention of exiting the investment usually within three to seven years perhaps after changing management to increase profitability. What makes it a leveraged buyout is the fact that the acquiring firm will fund the purchase of the company with a relatively high level of debt and then pay off the debt with the cash flows produced by the firm. This means that by the time the fund is ready to sell the company, the business will ideally have little to no debt, and the PE firm will collect a higher percentage of the selling price and/or use the excess cash flow to pay themselves a dividend since the debt has been reduced or paid off.*

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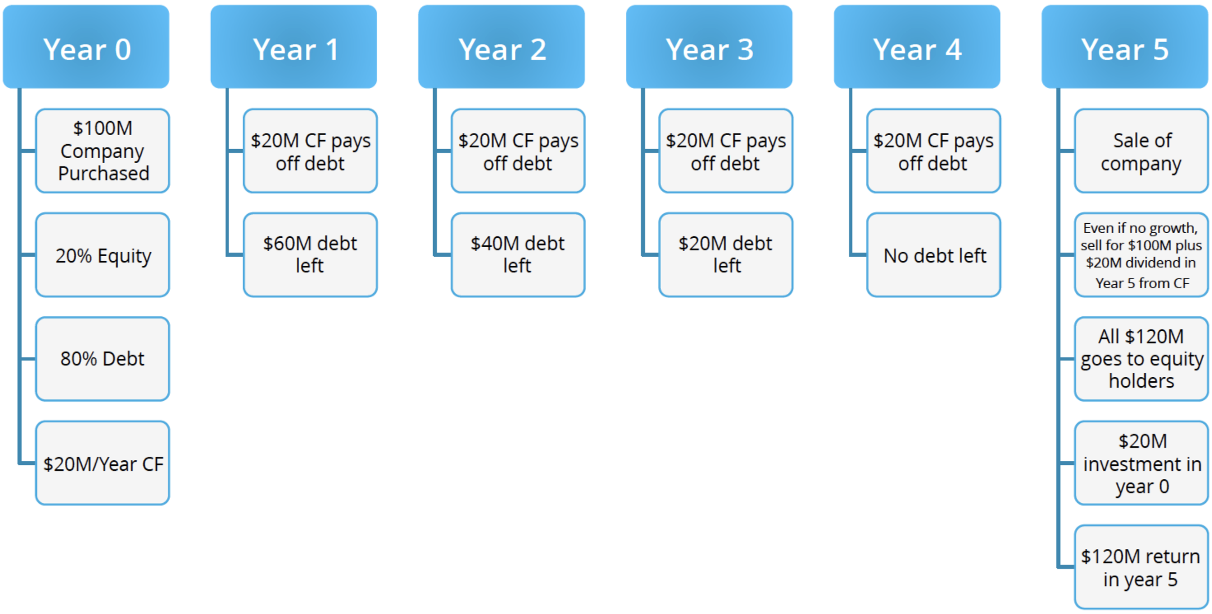
HOW DO YOU DETERMINE HOW MUCH A COMPANY SHOULD PAY IN AN M&A DEAL?

- If the Seller is public, you assume a premium over the Seller's current share price based on average premiums for similar deals in the market (usually between 10% and 30%). You can then use the DCF, Public Comps, and other valuation methodologies to sanity-check this figure. The Purchase Price for private Sellers is based on the standard valuation methodologies, and you usually link it to a multiple of EBITDA or EBIT since private companies don't have publicly traded shares. If the Buyer expects significant synergies, it is often willing to pay a higher premium or multiple for the Seller, though the impact isn't necessarily 1:1.

SAMPLE OF HOW A LEVERAGED BUYOUT WORKS (SEE VISUALIZATION BELOW)



WHAT WOULD BE A REAL-LIFE EXAMPLE OF AN LBO AND WHAT ARE THE DIFFERENT PIECES?

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SAMPLE ANSWER: *A good real-life example of an LBO is borrowing money to purchase an apartment to rent out. The down payment on the apartment is equivalent to the equity investment, while the mortgage loan is the debt or "leverage" in an LBO transaction. The interest payment on the mortgage would be interest payment on the debt, while the principal payments on the loan are made with the cash flows you receive from renting out the apartment which is similar to amortization of the debt. Finally, the sale of the property, hopefully for a gain, would be exiting the investment through either a sale or an IPO.*

HOW COULD A FIRM INCREASE THE RETURNS ON AN LBO ACQUISITION?

- In order to increase a private equity fund's return on an LBO investment, a number of drivers can be changed.
- The most obvious way to increase potential return is to increase the sale price when the firm monetizes its investment.
- In modeling the returns, you could increase your projections for the acquired company's earnings and cash flows.
- The firm could negotiate a lower purchase price, which would have a similar effect to raising the selling price.
- Finally, the private equity firm could increase the amount of leverage or debt on the deal. The higher the leverage, the higher the return, all else equal. However, increasing the leverage puts more financial stress on the company being acquired and increases the bankruptcy risk.

SAMPLE ANSWER: *There are a many ways a private equity fund can increase the return on investment. First, it could increase the sale price at the time of monetization either through an increase in operating profits or through multiple expansion. Up front, it could negotiate a lower purchase price or increase the amount of leverage used to purchase the company, which would imply a smaller equity check with a higher internal rate of return on the capital deployed.*

HOW DO YOU PICK PURCHASE MULTIPLES AND EXIT MULTIPLES FOR AN LBO?

- When a private equity firm is evaluating an investment, it is looking to acquire the company for the lowest multiple possible (all else equal), then improve the business through operational

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changes, and ultimately sell it for a higher multiple off of increased earnings.

- These multiples are determined as in any other M&A transaction. The analysts working on the transaction will look at M&A comparable transactions and public company comparables. (See earlier descriptions of valuation techniques for more details.)

SAMPLE ANSWER: *Purchase and exit multiples for an LBO transaction are determined using many of the same techniques used in general valuations for an M&A transaction such as precedent transactions analysis or public company comparables analysis.*

WHAT MAKES A COMPANY AN ATTRACTIVE TARGET FOR A LEVERAGED BUYOUT?

- Most importantly, an LBO needs a steady stream of cash flows so it can pay down the debt used to purchase the business.
- This means the company should be at the lower end of the risk spectrum, should have limited need for additional capital expenditures, and preferably should be in a relatively stable industry.
- A good candidate should also have a strong management team (unless the private equity firm intends to replace them), the ability to reduce its cost structure, and a solid asset base that can be used as collateral.

SAMPLE ANSWER: *The most important characteristic of a good LBO candidate is steady cash flows. The firm ideally could pay off a significant portion or all the debt raised in the acquisition over the life of the investment horizon, with minimal bankruptcy risk. Some other attractive characteristics include strong or replaceable management, cost-cutting opportunities, and a non-cyclical industry.*

WHY WOULD A PRIVATE EQUITY FIRM BUY A COMPANY THAT WAS CONSIDERED RISKIER THAN A TYPICAL LBO CANDIDATE?

- Many PE firms do purchase companies in distressed situations, where the target company may appear very "risky."
- If a company is in distress and may be at risk of defaulting on interest payments, or possibly is currently in the bankruptcy process, a PE firm may be able to negotiate a very attractive

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purchase price for the business and acquire it for a significant discount to what the company would cost if it were performing well.

- In a bankruptcy situation, the PE firm would negotiate with existing lenders and possibly repay the existing debt-holders less than the par amount of their investment, while putting a new capital structure in place.
- Through the acquisition, the PE firm would look to work with management, improve the business, and hope to resell the acquired company for a higher multiple and valuation in the future, creating a high return on their investment.

SAMPLE ANSWER: *Many private equity firms will look to purchase companies in distressed situations or out of bankruptcy. When they do this, they typically can negotiate lower purchase prices than for companies that are performing. The PE firm will put in place a new capital structure and then work with management to improve the business, hoping to resell the business for a higher multiple and valuation and earn a significant return on investment.*

WHAT IS A DIVIDEND RECAPITALIZATION?

- In an LBO transaction, a PE firm will put a large amount of debt on the company it is acquiring and will pay off that debt with free cash flow generated by the business over the life of the investment.
- This pay down of debt will lower the leverage ratios and therefore the risk.
- Eventually, the PE firm will look to fully exit its investment through a sale or IPO, but in the interim, the PE firm (along with the other owners of the company) may want to take earnings out of the business, rather than just further paying down debt.
- One way to do this is a dividend recapitalization transaction. Here is an example of how this works:
    - Company purchased by a PE firm with $500mm of debt and $100mm Equity at 5.0x leverage

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on$100mm of EBITDA.

- Three years into the investment the business has grown and the company has paid down $200mm of debt from free cash flow and has reduced leverage to 2.0x with $300mm of debt on $150mm of EBITDA.
- Since leverage is now low compared to other similar companies, the owners may decide to do a dividend recap to realize part of their investment returns.
- The company goes back into market, issuing $750mm of debt, which returns the company to 5.0x leverage on $150mm of EBITDA. The funds from this transaction repay the outstanding $300mm of debt, and pay a $450mm dividend to the owners of the business.

SAMPLE ANSWER: *A dividend recap typically occurs in the middle of a PE firm's investment in a company when that company has been performing and paying down debt, reducing leverage. The owners of the business (normally the PE firm) will go back to market looking to issue new debt both to repay the existing debt and to fund a distribution to shareholders.*

WHAT ARE APPROPRIATE COVERAGE AND LEVERAGE RATIOS FOR A BUSINESS THROUGH AN LBO OR OTHER ACQUISITION?

SAMPLE ANSWER: *This is completely dependent on the type of business. The appropriate levels are what the market is willing to bear for similar companies in similar industries, determined by what deals have been closed recently. All else equal, higher leverage or lower interest coverage is going to make investors demand a higher interest rate on the debt because the investment is considered more risky. However, in a typical LBO or M&A deal, the company most likely will be levered somewhere between 2x and 10x, depending on the industry.*

WHAT IS THE "TAX-SHIELD" CREATED BY AN LBO?

- In an LBO, the company issuing the debt will be paying interest on that debt, which is an expense. Since this interest is an expense and is tax deductible, it therefore reduces the amount of taxes the company pays, creating the "tax-shield."

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WHAT IS VENTURE CAPITAL?

SAMPLE ANSWER: *Venture capital is a specific type of private equity that provides financial capital to high-potential, high-risk startup companies. In exchange for providing this high-risk capital, the provider (usually a venture capital fund) will receive significant private equity ownership in the business. They will typically also get board seats and influence, in order to help these usually young businesses through the growth process. Many times these investments end up being worth nothing, but the goal for the VC firm is to hit a couple of home runs. For example, Accel Partners invested $12.7 million in Facebook, which ended up growing to over $8.5 billion in value.*

WHAT ARE DEFERRED TAX ASSETS (DTA'S) AND DEFERRED TAX LIABILITIES (DTL'S), AND HOW ARE THEY CREATED IN AN M&A TRANSACTION?

- DTAs and DTLs are created in an M&A transaction through the write-up or write-down of assets.
- If an asset is written up, the company is experiencing a gain and a DTL is created because the new asset will have a higher depreciation expense in the short term, which means the company will pay lower taxes. These taxes must be paid back at some point, which is why a liability is created.
- The opposite is true when an asset is written down in value.

IN A LEVERAGED BUYOUT, WHAT WOULD BE THE IDEAL AMOUNT OF LEVERAGE TO PUT ON A COMPANY?

- In order to maximize returns, you would like to finance the deal with the least amount of equity possible.
- However, there is a fine line to walk between maximizing returns and putting the company into financial distress with too much debt in the capital structure.
- Typically, an analyst will look at the amount of leverage on similar businesses in the past. The most common ratio an analyst looks at is Debt/EBITDA, or leverage. A company with less leverage may demand a lower interest rate and vice versa.

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SAMPLE ANSWER: *In order to maximize returns in a leveraged buyout, the acquiring firm wants to finance the deal with the least amount of equity possible. However, they need to be careful as to not put the company into financial distress by overburdening the acquired company with debt.*

WHAT ARE THE THREE TYPES OF MERGERS AND WHAT ARE THE BENEFITS OF EACH?

- The three types of mergers are horizontal, vertical, and conglomerate. A horizontal merger is a merger with a competitor and ideally will result in synergies. A vertical merger is a merger with a supplier or distributor and ideally will result in cost cutting. A conglomerate merger is a merger with a company in a completely unrelated business and is most likely done for market or product expansions or to diversify its product platform and reduce risk exposure.

WHAT IS AN EXCHANGE RATIO AND WHY WOULD A COMPANY USE IT?

- An exchange ratio is one way of structuring an M&A transaction so that is funded either fully or partially with stock.
- If Company A is going to purchase Company B, Company A may give the owners of Company B shares in the new company instead of cash. The owners of Company B will get X shares of Company A for each of their shares of Company B. That "X" is the exchange ratio.
- This benefits the acquiring company because by assigning a share exchange ratio, rather than a dollar amount per share, they protect themselves if the stock price of Company A falls after announcement of the transaction. The selling company would prefer a fixed dollar amount in stock if they believe the stock is going to fall in value.

SAMPLE ANSWER: *An exchange ratio is a way of financing an acquisition by assigning a number of shares in the new company to be exchanged for each existing share in the original company. For example, Company A could acquire Company B and say, "We will give you 2 shares of the new, combined Company AB for each of your shares of Company B," rather than saying, "You will receive $XX of Company AB stock for each share of Company B."*

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WHAT ARE SOME DEFENSIVE TACTICS THAT A TARGET FIRM MAY EMPLOY TO BLOCK A HOSTILE TAKEOVER?

- A poison pill shareholder rights plan gives existing shareholders the right to purchase more shares at a discount in the event of a takeover, making the takeover less attractive by diluting the acquirer.
- A Pac-Man defense is when the company that is the target of the hostile takeover turns around and tries to acquire the firm that originally attempted the hostile takeover.
- A white knight is a company that comes into the company, which is the target of a hostile takeover with a friendly takeover offer.

WHAT IS A MERGER MODEL?

SAMPLE ANSWER: *A merger model is a way to look at the financials of two companies, the purchase price, and how the purchase is made to determine whether it is accretive or dilutive to the buyer. The analyst will first make assumptions about purchase price and structure, and then project an Income Statement for the new company and calculate an EPS number for the combined entity.*

WHAT KIND OF ASSUMPTIONS WOULD YOU HAVE TO MAKE WHEN COMING UP WITH A NEW INCOME STATEMENT FOR THE COMBINED COMPANY IN A MERGER MODEL?

SAMPLE ANSWER: *A big reason for combining two companies is the synergies that are realized through the merger. First are revenue synergies, which you would add to the revenue of the combined entity's revenues. These could be due to leveraging each others' customer base, cross-selling, etc. Another type of synergy is a cost-saving synergy. These synergies are normally added back to operating income and are the results of overhead consolidation, elimination of duplicate SG&A expenses, raw material price reduction due to economies of scale, etc.*

WHICH TYPE OF SYNERGY IS MOST IMPORTANT?

SAMPLE ANSWER: *Since cost-saving synergies such as a reduction in employees are typically more quantifiable than estimates on gains from things like cross-selling, cost savings synergies are normally taken a bit more seriously.*

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HOW DOES AN ACQUIRER DETERMINE THE MIX OF CASH, DEBT AND STOCK TO USE FOR AN ACQUISITION?

SAMPLE ANSWER: *Since Cash is cheapest for most acquirers, they'll use all the Cash they can before moving to the other funding sources. So you might assume that the Cash Available equals the Acquirer's current Cash balance minus its Minimum Cash balance. After that, Debt tends to be the next cheapest option. Acquirer might be able to raise Debt up to the level where its Debt / EBITDA and EBITDA / Interest ratios stay in-line with those of peer companies. So if it's levered at 2x EBITDA now and similar companies have up to 4-5x Debt / EBITDA, it might be able to raise Debt up to that level. Finally, there's no strict limit on the Stock an Acquirer might issue, but very few companies would issue enough to give up control of the company, and some Acquirers will issue Stock only up to the point at which the deal turns dilutive.*

SAMPLE FOLLOW UP QUESTION: Which purchase method does the seller prefer?

SAMPLE FOLLOW UP ANSWER: *The Seller has to balance taxes with the certainty of payment and potential future upside. To a Seller, Debt and Cash are similar because they mean immediate payment, but also immediate capital gains taxes and no potential upside if the Buyer's share price increases. But there's also no risk if the Buyer's share price decreases. Stock is more of a gamble because the Seller could end up with a higher price if the Buyer's share price increases, but it could also get a lower price the share price drops. The Seller also avoids immediate taxes with Stock since it pays taxes only when the shares are sold. So the preferred method depends on the Seller's confidence in the Buyer: Cash and Debt are better when there's uncertainty, while Stock may be better with large, stable Buyers.*

IF A COMPANY COULD ACQUIRE ANOTHER COMPANY USING CASH ONLY, WHY WOULD THEY CHOOSE NOT TO DO SO?

SAMPLE ANSWER: *There are many reasons why a company may not simply finance a purchase with cash. Especially in times of economic turmoil, a company may want to keep a healthy cushion of cash on the Balance Sheet, so it can weather the storm. A company may not want to use cash if its stock is trading very strongly. If the buying company's stock is trading high, it gives the acquiring company a relatively "rich" currency with which to make acquisitions.*

IF COMPANY A HAS A P/E MULTIPLE OF 25X AND ACQUIRES COMPANY B FOR A PURCHASE PRICE OF 15X P/E, WILL THE DEAL BE ACCRETIVE?

SAMPLE ANSWER: *You can't tell unless you know that it's a 100% Stock deal. If it is a 100% Stock deal, then it will be accretive because the Buyer's P / E is higher than the Seller's, indicating that the Buyer's Cost of Acquisition (1 / 25, or 4%) is less than the Seller's Yield (1 / 15, or 6.7%).*

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SAMPLE FOLLOW UP QUESTION: Assume that the company has 10 shares outstanding at $25/share and its net income is $10. It acquires company B for an equity value of $150 and company B also has $10 of net income. Assuming the two companies have equal tax rates, how accretive is this deal? Walk me through the math.

SAMPLE FOLLOW UP ANSWER: *Company A's EPS is $10 / 10 = $1.00. To do the deal, Company A must issue 6 new shares since $150 / $25.00 = 6, so the Combined Share Count is 10 + 6 = 16. Since no Cash or Debt were used and the tax rates are the same, the Combined Net Income = Company A Net Income + Company B Net Income = $10 + $10 = $20. The Combined EPS, therefore, is $20 / 16 = $1.25, so there's 25%accretion.*

SAMPLE FOLLOW UP QUESTION: Assume that company A uses debt with a 10% interest rate to acquire company B. Is this deal still accretive? At what interest rate does it change from accretive to dilutive?

SAMPLE FOLLOW UP ANSWER: *The Weighted Cost of Acquisition would be 10% * (1 – 40%), or 6%, so the deal would still be accretive because that Cost is less than the Seller's Yield of 6.7%. For the deal to turn dilutive, the After-Tax Cost of Debt would have to exceed 6.7%. Since 6.7% / (1 – 40%) = 11.1%, the deal would turn dilutive at an interest rate above 11.1%.*

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Brainteasers

Brainteasers

There is no way to prepare for every brainteaser. There are many that are commonly used in interviews and you can prepare for those, but remember that answering the brainteaser the way the interviewer wants to hear it answered is more important than actually getting the answer correct. Remember not to lose your cool.

WHAT'S 17 SQUARED? WHAT'S 18X22?

- Don't worry; they want to know how you will handle this question, and it is not difficult if you think about it correctly.
- Think 17 x 17 is just 17x10 plus 17x7. You know 17x10 is 170. Now17x7is 10x7 and 7x7. This gives you 170+70+49, or 289. Whatever you do, don't panic!
- Now see if you can do 18x22: 18x20 + 18x2. Easy, 360 + 36=396.
- As far as brainteasers go, this is a rather common one. You will do better if you have practiced these types of questions.

TWO BOATS ARE GOING TOWARDS EACH OTHER AT 10 MILES PER HOUR. THEY ARE 5 MILES APART. HOW LONG UNTIL THEY HIT?

- Be careful here. The initial instinct is to say half an hour. However, both boats are moving at 10 miles per hour, so they are converging at 20 miles per hour, meaning they will crash in ¼ of an

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hour, or 15 minutes.

HOW MANY NYSE-LISTED COMPANIES HAVE 1 LETTER TICKER SYMBOLS?

- It could be 26 (letters in the English alphabet), but it is actually only 24 because I & M are saved for Intel and Microsoft, in case they change their minds.

A DRIVER IS GOING TO DRIVE 100 MILES. IF THEY DRIVE THE FIRST 50 MILES AT 50 MILES PER HOUR, HOW FAST DO THEY HAVE TO DRIVE THE SECOND TO AVERAGE 100 MILES PER HOUR FOR THE ENTIRE RUN?

- Most people think "oh, well if they drive the second leg at 150 miles per hour they will average 100 miles per hour."
- This is WRONG! Think about it for a second. They went the first 50 miles at 50 MPH, which means they drove for an hour. They want to drive the entire 100 miles at an average of 100 MPH, which means they would have to drive the entire 100 miles in only 1 hour. Since they have already been driving for an hour, it is impossible to average 100 MPH!
- There are TONS of variations on this question. If you get it, make sure you put on a good show and act like you don't know the answer right away; otherwise you will get no credit.

HOW MANY GAS STATIONS ARE IN THE UNITED STATES?

- With a question like this, the interviewer is looking at your thought process, not that you can actually figure out how many gas stations are in the U.S.
- The easiest way to go about answering a question like this is to start small and work your way out. Think about your town. Say your town has 30,000 people, and you have 5 gas stations serving that area. The United States has approximately 300 million people, so that means there are 10,000 "towns" in the United States, and 50,000 gas stations.
- You then want to make adjustments. For example, assume that a quarter of the population lives in larger cities where there is only 1 gas station per 30,000 people. So you have 7,500 towns with 5 gas stations and 2,500 "towns" with only 1. Do a little mental math and you get a number of

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40,000 gas stations in the U.S.

IF YOU WERE GOING TO BUILD A BUILDING IN A CITY AND HAD NO PHYSICAL RESTRAINTS, NO CAPITAL RESTRAINTS, AND NO OTHER LIMITATIONS, HOW TALL WOULD YOU BUILD IT?

- This question is similar to the question above in that there is no right or wrong answer.
- Your interviewer is not looking for an actual height in feet but rather what kinds of things you would think about in determining the height.
- Here are some things to think about:
  - Measuring the demand for space in a new building
  - How high people would be willing to purchase space due to safety concerns
  - How much you can sell the space for in comparison with how much it costs to construct/maintain
  - How much the demand for the space will grow over the life of the building, so how much extra space should you build into the design

YOU ARE LATE FOR A PITCH WITH THE CEO OF A COMPANY IN THE TOWN OF TRUTH. YOU ARE SPEEDING DOWN A ROAD THAT SUDDENLY FORKS, AND THERE ARE NO SIGNS. YOU KNOW THAT ONE WAY LEADS TO THE TOWN OF TRUTH WHERE EVERYONE TELLS THE TRUTH AND THE OTHER WAY LEADS TO THE TOWN OF LIES WHERE EVERYONE TELLS LIES. THERE IS A RESIDENT OF ONE OF THE TOWNS STANDING AT THE CROSSROADS BUT YOU DON'T KNOW WHICH TOWN HE'S FROM. YOU ONLY HAVE TIME TO ASK HIM ONE QUESTION.... SO WHAT DO YOU ASK HIM?

- The key to this question is to ask a question which both guys would have to answer the same way. If you ask him to point out which town he is from, either of them would point to the Town of Truth.

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YOU HAVE A FIVE GALLON CONTAINER AND A THREE GALLON CONTAINER WITH NO MARKINGS ON EITHER. YOU ARE STANDING NEXT TO A HOSE. MEASURE EXACTLY TWO GALLONS OF WATER.

- This is one of the more common brainteasers. If you are smart and want to look good, you should sit there and "ponder" the answer for a few seconds, like you are working it out in your head, not that you simply memorized the answer. There are also other versions of this question, so don't just hear "you have a five gallon container..." and assume it's going to be this problem and this answer.
- First you fill the 5 gallon container; then you dump it into the 3 gallon container, leaving you with 2 gallons in the 5 gallon container.

HOW MANY DEGREES ARE THERE BETWEEN A CLOCK'S TWO HANDS WHEN THE CLOCK READS 3:15?

- The quick thought would be 90 degrees, but it isn't. If the clock is 360 degrees, the minute hand will be exactly at the 90 degree mark. The hour hand will be ¼ of the way between the 3 and the 4. Since there are 12 numbers, the 3 and the 4 are 30 degrees apart, making the hour hand 7.5 degrees beyond the 3, and 7.5 degrees from the minute hand.

A STOCK IS TRADING AT 10 AND 1/16. THERE ARE 1 MILLION SHARES OUTSTANDING. WHAT IS THE STOCK'S MARKET CAP?

- This is just a test of your mental math. If a fourth is .25, an eighth is .125, and a sixteenth is .0625... The stock price is 10.0625 and the Market Cap is 10.0625 million.

YOU HAVE 50 BLACK BALLS AND 50 WHITE BALLS (TOTAL OF 100) AND TWO BUCKETS. HOW WOULD YOU SPLIT THE BALLS BETWEEN THE TWO BUCKETS TO MAXIMIZE THE CHANCE OF SELECTING A BLACK BALL WHEN ONE BALL IS CHOSEN FROM ONE OF THE BUCKETS AT RANDOM?

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SAMPLE ANSWER: *The best way to maximize the chances of selecting a black ball would be to put one black ball in one of the buckets and all the rest of the 99 balls in the other bucket. Since you have a 100% chance of selecting a black ball if you choose the first bucket, and a 49.5% chance of selecting a black ball if you choose the other (49/99), the overall chances of selecting a black ball is (50% x 100%) + (50% x 49.5%) = 74.7%.*

WHAT IS THE SUM OF ALL THE NUMBERS FROM 1 TO 100?

- As with most brainteasers your interviewer is looking to see how you think through problems. The way you do not want to answer this question is by sitting there and saying "Ok, 1+2 is 3, 3+3 is 6, 6+4 is ten…" This is extremely inefficient.

SAMPLE ANSWER 1: *Fake pause… Well, between 1 and 100 there are 50 sets of 101, for example 100 and 1, 99 and 2, 98 and 3, and so on. 50 sets of 101 is 5,050; so the sum of 1 to 100 would be 5,050.*

SAMPLE ANSWER 2: *Fake pause… So the average of all of those numbers 50.5. If you take the average and multiply it by the number of numbers, you get 100 times 50.5 or 5,050.*

WHAT IS THE PROBABILITY THAT THE FIRST BUSINESS DAY OF A MONTH IS A MONDAY?

SAMPLE ANSWER: *Each day has a 1 in 7 chance of being the first day of the month. However, if the month starts on a Saturday or a Sunday, the first business day of the month will be a Monday. Therefore, the chances of the first business day being a Monday is 3 in 7 since if the month starts on Saturday, Sunday or Monday, the first business day is a Monday.*

YOU ARE GIVEN 12 BALLS AND A SCALE. OF THE 12 BALLS, 11 ARE EXACTLY THE SAME WEIGHT AND 1 WEIGHS SLIGHTLY MORE. HOW CAN YOU FIND THE HEAVIER BALL USING THE SCALE ONLY THREE TIMES?

SAMPLE ANSWER:

1. *Weigh 5 balls against 5 balls. If the scale is balanced, then discard those 10 balls and weigh the remaining 2 against each other (Second Use of Scale). The heavier ball is the one you are looking for.*
2. *If one of the first two groups is heavier, then discard the lighter group. Of the heavier group, weigh 2 against 2. If they are equal, then the 5th ball, the one that was not weighed, is the one you are looking for.*

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A ROOM WITH NO WINDOWS HAS 3 LIGHT BULBS. YOU ARE STANDING OUTSIDE WITH 3 SWITCHES THAT CONTROL THE THREE BULBS. IF YOU CAN ONLY ENTER THE ROOM ONE TIME, HOW CAN YOU DETERMINE WHICH SWITCH CONTROLS WHICH BULB?

SAMPLE ANSWER: *First turn on two switches: call them Switch 1 and Switch 2. Leave them on for a couple minutes to let them get nice and hot. Then, turn off Switch 1 and enter the room. The bulb that is lighted should be the one that is controlled by Switch 2. Of the remaining two bulbs, the one that is hot is the one controlled by Switch 1. The last one, off and not hot, is controlled by Switch 3.*

WHAT IS THE GREATEST DOLLAR VALUE IN COINS YOU CAN HAVE IN YOUR HAND AND STILL NOT BE ABLE TO MAKE CHANGE FOR A DOLLAR?

SAMPLE ANSWER: *Start with quarters since they have the highest value. Then descend in value from dimes to nickels to pennies, taking the maximum number of each that you can have without reaching a dollar. The maximum you can take will be 3 quarters, 4 dimes, 0 nickels and 4 pennies. Remember that you can't take a nickel because 3 quarters, 2 dimes and a nickel would add up to a dollar. The total value of these coins is $1.19.*

YOU HAVE A LARGE CUBE (10X10X10) MADE UP OF SMALL CUBES (1X1X1). IF I WERE TO REMOVE ALL OF THE SMALL CUBES WITH A SURFACE ON THE EXTERIOR, HOW MANY SMALL CUBES WOULD BE LEFT?

SAMPLE ANSWER: *If you remove all of the small cubes on the exterior you would be left with an 8x8x8 cube and therefore there would be 512 small cubes remaining.*

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[Current Event Questions]

Current Event Questions

- One of the keys to a successful interview is being able to carry on intelligent conversation about macro issues that affect the world and shape the finance industry. In order to do that, you must stay up to date on current events.
- Try to read at least the Wall Street Journal or a business website for at least 30 minutes a day in order to stay up to speed.
- While topics of conversation are constantly changing, the bullet points below present some of the events that are current as of this guide's publication date. Read up on them and be able to talk about them in your interviews.
  - U.S. Trade Tensions
  - Upcoming Presidential Elections Globally
  - Immigration Reform and its Effect on the Economy
  - Interest Rates
  - Oil Market Dynamics (Supply & Demand) and Reliance on Oil Producing Export Countries (OPEC)
  - Social Media & Tech IPOs

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- Healthcare
- U.S. Key Macroeconomic Indicators (and Parallels to Housing/Mortgage Crisis of 2008-2009)

- Questions about current events may be asked and answered like the question below:

WHY ARE COMPANIES LIKE GOOGLE, FACEBOOK, NETFLIX, APPLE, TWITTER, UBER, LYFT, ETC. EXPERIENCING UNPRECEDENTED MULTI- BILLION DOLLAR VALUATIONS (AND VOLATILITY)?

- The key here is that investors are anticipating extremely high future earnings for these businesses due to their reach, ability to scale and grow, and their asset-light business models. As a result, investors are more focused on annual/quarterly user growth and revenues as opposed to profit margins.
- Investors believe that these companies will, in the future, be able to tap into the earning power of their millions of users in some way that isn't currently happening. This could be realized in the form of future product launches, expansions into different geographic regions or other markets, or through fundamental business model changes. In the past, social media companies were able to execute upon this by selling ad space on their social networks and platforms.
- However, as this market has become increasingly saturated and competitive, social media and other tech companies have had to find another way to monetize their user bases. Many of these businesses have since revealed that they have engaged in questionable business practices with private information sourced from their user bases. This increased scrutiny on data privacy/security and how social media/tech companies use the information of their users has contributed to a significant amount of market volatility in the sector.

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SAMPLE ANSWER: *With the social media giant Facebook, investors are expecting the company to find a better way to monetize their massive user base while leveraging their technological leadership to better manage costs. With over 2 billion users, if Facebook can figure out how to profitably diversify its product offering and expand its portfolio of business services (while maintaining the security of its users' private information), their earnings could be astronomical!*

SAMPLE ANSWER: *Another reason a company like Facebook may be valued in the billions is because companies like Microsoft are willing to pay astronomical premiums for a small (or controlling) equity stake in order to catch the wave of the future. For example, when Microsoft invested in 2007, Facebook was valued at $15 billion; at its IPO in 2012, Facebook's value was around $100 billion. Similarly, Microsoft paid a whopping $26.2 billion to acquire a controlling stake in LinkedIn, a smaller social media business with >400 million users, in 2016 when the company was not profitable.*

SAMPLE FOLLOW-UP DISCUSSION TOPIC: *Analysts do not expect recent stock market volatility to dampen the excitement for a number of unicorn IPOs this year. Uber and Lyft filed confidential registration paperwork with the SEC late last year with the intention of going public in early 2019. IPO rumors have also circled around emerging companies like Airbnb, Peloton, Palantir and Slack. Those companies have an average age of >10 years, which means early employees and investors are seeking liquidity. The public markets may have a difficult time finding comparable companies to benchmark them against, especially Lyft and Uber, for which there are no publicly-traded comparable companies in the ride-sharing market.*

WHAT UPCOMING POLITICAL ELECTIONS ARE YOU MONITORING AND HOW MAY THEY IMPACT THE GLOBAL ECONOMY?

SAMPLE ANSWER: *The Nigerian election takes place in February. 4 years ago, President Muhammadu Buhari gained power on a surge of optimism, pledging to restore security and end corruption. His Presidential record has been mixed, and his popularity and health have declined (he recently denied rumors of being replaced by a body double). The old regime may regain political power, impacting the free flow of goods through the country.*

SAMPLE ANSWER: *The Indonesian election takes place in February. President Joko Widodo is a charismatic reformer, but he must combat the misinformation that has spread regarding his religion. He selected an influential Muslim cleric as his running mate to help to undercut his opponent. If he loses, political analysts fear a rollback of democracy.*

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SAMPLE ANSWER: *The Indian election in April/May may have the biggest impact to the global economy, as recent losses in state elections have hindered the likelihood of reelection for Prime Minister Narendra Modi, whose BJP party may struggle to win enough seats to form the next government. This is a shockingly rapid decline for a political leader appeared untouchable until fairly recently.*

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Other

Other

IF YOU WORKED IN THE FINANCE DIVISION OF A COMPANY, HOW WOULD YOU DECIDE WHETHER OR NOT TO INVEST IN A PROJECT?

SAMPLE ANSWER: *In order to decide, you determine the IRR of the project. The IRR is the discount rate, which will return an NPV of 0 of all cash flows. If the IRR of the project is higher than the current cost of capital for the project, then you would want to invest in the project.*

IF YOU HAD $1 MILLION IN FUNDS TO START ANY BUSINESS, WHAT WOULD YOU DO?

- Overall, $1 million isn't that much to start a business, so don't tell your interviewer that you would start a pharmaceutical company and try and develop a drug to cure Alzheimer's, that's not realistic.
- Think about starting a business that won't take a ton of up front capital such as a service-based business with little overhead costs, a small business or a software business that just requires a programmer or two.

WHAT IS AN INSTITUTIONAL INVESTOR?

SAMPLE ANSWER: *An institutional investor is an organization that pools large sums of money and puts that money to use in other investments. Some examples of institutional investors are investment banks, insurance companies, retirement funds, pension funds, hedge funds, mutual funds, and multi-family offices. They act as specialized investors who invest on behalf of their clients.*

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WHAT IS A HEDGE FUND?

SAMPLE ANSWER: *A hedge fund is a loosely regulated investment pool. Generally speaking, they are open only to high net worth individuals or institutional investors since they are limited to 100 or 500 investors. They use various strategies to hedge against risk with the goal of making a profit regardless of the market environment. These funds often take on high risk and are highly leveraged to give their clients the potential for higher returns. They have much more latitude in the kinds of securities they can invest in because they are typically not restricted by most of regulations that other mutual funds must follow.*

WHAT IS SECURITIZATION?

- Mortgage-backed securities are probably the most widely known securitized asset. A bank will take a pool of mortgages they issued and sell off the future cash flows (mortgage payments) from those mortgages to another investor.

SAMPLE ANSWER: *Securitization is when an issuer bundles together a group of assets and creates a new financial instrument by combining those assets and reselling them in different tiers called tranches. One of the reasons for the recession has been the mortgage-backed securities market, which is made up of securitized pools of mortgages.*

WHAT IS ARBITRAGE?

- Arbitrage is the simultaneous buying and selling of two related assets in order to capture a guaranteed profit from the trade.
- This opportunity occurs when two assets are inaccurately priced by the markets. Since markets today are so fast, traders require sophisticated computer software to monitor the investment universe, identify arbitrage opportunities, and take advantage of them, because they often exist only for a matter of seconds.

SAMPLE ANSWER: *Arbitrage occurs when an investor buys and sells related assets simultaneously in order to take advantage of temporary price differences. Because of the technology now employed in the markets, the only people who can truly take advantage of arbitrage opportunities are traders with sophisticated software since price inefficiencies often close in a matter of seconds.*

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[Appendix A: Income Statement Basics]

Appendix A: Income Statement Basics

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(Apple's 2008 Income Statement)

Revenue or Net Sales: This is the amount of money, total, that a firm recieves for the production of its goods or services. For a company like Apple, it would be all the money it brings in for sale of computers, iPods, iPhones, etc. For a service company, it would include all those fees brought in from those services.

Cost of Sales or Cost of Goods Sold: These are the direct costs that go into the production of the goods and services the firm produces. For example, with Apple, Cost of Sales includes raw material costs of the computers themselves, as well as any labor costs that are required for the manufacturing process.

Gross Margin: Gross margin is Revenue minus the Cost of Sales. This number is how much money a company retains from the sale of a good or service after paying for the production of that good or service, but not including any additional expenses the company occurs after the production of the good or service. This money can be put towards paying operating expenses.

Operating Expenses: These are any costs t that a firm will incur through its normal course of business, but not including the manufacturing of the goods themselves. Operating expenses for a company like Apple would include employees' salaries (not those involved in manufacturing), marketing expenses (SG&A), research and development, etc.

Three fiscal years ended September 27, 2008	2008
Net sales	$ 32,479
Cost of sales (1)	21,334
Gross margin	11,145
Operating expenses:	
Research and development (1)	1,109
Selling, general, and administrative (1)	3,761
Total operating expenses	4,870
Operating income	6,275
Other income and expense	620
Income before provision for income taxes	6,895
Provision for income taxes	2,061
Net income	$ 4,834
Earnings per common share:	
Basic	$ 5.48
Diluted	$ 5.36
Shares used in computing earnings per share:	
Basic	881,592
Diluted	902,139

Operating Income: This is the income that a firm produces from its normal operations. For Apple, this would include the profit from the production and sales of its computers and other products, after paying all operating expenses. This would not include any profit from investments, minority interests in other companies, debt and interest payments, etc.

Other Income and Expenses: This includes any income or expenses from non-operating activities, such as other investments or interest payments.

Provision for Income Taxes: This is the amount of money a company allocates to pay its income taxes.

Earnings Per Share: Earnings per Share is (Net Income - Dividends on Preferred Stock)/Average Shares Outstanding. This number is viewed by many as the single most important determinant of a firm's share price. Most analyst predictions are centered around this number. A company announcing an EPS below the analyst's expectations will likely result in a drop in share price, while an announcement above the expectations will likely result in an increase.

Note: There are normally footnotes to the Income Statement explaining how the company calculates most of its numbers and explains any adjustments made.

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[Appendix B: Balance Sheet Basics]

Appendix B: Balance Sheet Basics

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Balance Sheet Basics

(Apple's 2008 Balance Sheet)

A balance sheet is separated into three main sections: Assets, Liabilities and Equities.
Always remember that the balance sheet MUST balance, meaning
Assets=Liabilities+Equity

Assets:
Assets are broken down into two main categories, current and long term. Assets are essentially the items that a firm has ownership of .

Current Assets are any assets that are cash or can be converted into cash within one year. This includes accounts receivable, short-term investments and inventory.

Long-Term Assets are assets such as buildings or land that would take more than a year to change into cash. Long-term assets are tangible assets (buildings, computers, land, etc) but also include intangible assets. Intangible assets include the value of things such as goodwill, patents, copyrights, licenses, etc. The company approximates the values of these assets.

Current Liabilities are any liabilities the company must pay within the next 12 months. These are important because the company needs to have liquid assets available to pay off these debts. These include notes payable (aka short-term debt), accounts payable, accrued expenses and the current portion of long-term debt. Current portion of long-term debt includes and principal and interest on outstanding long-term debt that will need to be paid in the next 12 months.

Long Term Liabilities include things like bonds issued, mortgages, or loans that are not to be repaid within the next 12 months.

Preferred stock holders have more priority to assets than common stock holders, but still less than debt holders. Preferred stock is almost a combination of a bond and common stock, since it pays a fixed dividend, and has the potential for capital appreciation. Not all companies have preferred stock

Common stock is the stock of a company that is traded on the public markets. Some common stock pays a dividend to its investors, while other common stock may simply appreciate in value over time. Common stock also gives owners the right to vote at shareholder's meetings since the owners of common stock are technically the owners of the company. When an investor buys a share of common stock they are purchasing a small piece of ownership in the company, and therefore the rights to that small piece of the company's profits, which are sometimes distributed as dividends.

Retained Earnings are the profits that a company generates and does not redistribute to their shareholders in the form of a dividend. This money usually will flow back into the assets section of the balance sheet in the form of cash or investments in new projects used to expand the business. A growing business will be more likely to reinvest its profits into the company than pay out a dividend. This will lead to capital appreciation of the stock, since the investment is assumed to produce higher profits in the future.

	September 27, 2008
ASSETS:	
Current assets:	
Cash and cash equivalents	$ 11,875
Short-term investments	12,615
Accounts receivable, less allowances of $47 in each period	2,422
Inventories	509
Deferred tax assets	1,447
Other current assets	5,822
Total current assets	34,690
Property, plant, and equipment, net	2,455
Goodwill	207
Acquired intangible assets, net	285
Other assets	1,935
Total assets	$ 39,572
LIABILITIES AND SHAREHOLDERS' EQUITY:	
Current liabilities:	
Accounts payable	$ 5,520
Accrued expenses	8,572
Total current liabilities	14,092
Non-current liabilities	4,450
Total liabilities	18,542
Commitments and contingencies	
Shareholders' equity:	
Common stock, no par value; 1,800,000,000 shares authorized; 888,325,973 and 872,328,972 shares issued and outstanding, respectively	7,177
Retained earnings	13,845
Accumulated other comprehensive income	8
Total shareholders' equity	21,030
Total liabilities and shareholders' equity	$ 39,572

Liabilities:
Anything that a company owes another party in exchange for borrowing in the past.

Equity:
Equity is sometimes referred to as "Owner's Equity" or "Shareholder's Equity" and represents the value of the company to the actual owners of the firm. This is the value of the Assets of the firm minus all outstanding debts since debt holders will get repaid before any equity holders get paid in the event of liquidation. The main components of equity are stock and retained earnings. Stock primarily comes in two forms, Preferred and Common.

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[Appendix C: Cash Flow Basics]

Appendix C: Cash Flow Basics

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(Apple's 2008 Cash FlowStatement)

Cash and Cash Equivalents, Beginning of Year: This number is pulled directly from the "Cash and Cash Equivalents" line item on the previous year's balance sheet. The balance sheet is a snapshot of what the company looks like at that time. So the cash number from the previous year will be how much cash the company holds at the end of that fiscal year, which is also the beginning of the NEXT fiscal year. Cash and equivalents are any items on a company's balance sheet that are either cash, or can be liquidated into cash immediately.

Cash from Operating Activities: This represents the amount of cash used by, or generated by a company from its normal operations, AKA production of its goods and services. It should be the primary source of cash. This is important because it shows a company's ability to generate cash from its core businesses, which is a good measure of the firm's health. For Apple, its core business is sales of its hardware and software products. Cash from operations takes into account any changes in operating assets and liabilities (since the company would have spent or gained cash to change the values of theses items).

Cash from Investing Activities: This shows the cash generated by the company through purchasing of or sale of income producing assets. These assets can include investments like other companies or investments in capital expenditures and Property, Plant and Equipment.

Cash from Financing: This section includes any cash generated by the sale of equity or debt, or cash used to repurchase equity or debt. This section will also include any dividends that are paid out to the company's shareholders.

Three fiscal years ended September 27, 2008	2008
Cash and cash equivalents, beginning of the year	$ 9,352
Operating Activities:	
Net income	4,834
Adjustments to reconcile net income to cash generated by operating activities:	
Depreciation, amortization and accretion	473
Stock-based compensation expense	516
Provision for deferred income taxes	(368
Loss on disposition of property, plant, and equipment	22
Changes in operating assets and liabilities:	
Accounts receivable, net	(785
Inventories	(163
Other current assets	(1,958
Other assets	(492
Accounts payable	596
Deferred revenue	5,642
Other liabilities	1,279
Cash generated by operating activities	9,596
Investing Activities:	
Purchases of short-term investments	(22,965
Proceeds from maturities of short-term investments	11,804
Proceeds from sales of short-term investments	4,439
Purchases of long-term investments	(38
Payments made in connection with business acquisitions, net of cash acquired	(220
Payment for acquisition of property, plant, and equipment	(1,091
Payment for acquisition of intangible assets	(108
Other	(10
Cash (used in)/generated by investing activities	(8,189
Financing Activities:	
Proceeds from issuance of common stock	483
Excess tax benefits from stock-based compensation	757
Cash used to net share settle equity awards	(124
Cash generated by financing activities	1,116
Increase in cash and cash equivalents	2,523
Cash and cash equivalents, end of the year	$ 11,875
Supplemental cash flow disclosures:	
Cash paid for income taxes, net	$ 1,267

One of the most important things that you will use the cash flow statement for is the calculation of free cash flow for a discounted cash flow valuation. As stated earlier in the guide, FCF is the amount of cash a firm generates after paying the required amount necessary to maintain its assets, and is used in the numerator of a discounted cash flow analysis.

NET INCOME
\+ DEPRECIATION AND AMORTIZATION
\- CHANGE IN NET WORKING CAPITAL
\- CAPITAL EXPENDITURES
= FREE CASH FLOW

CASH IS KING!!! Cash flow is important for a number of reasons. Many believe that investors are too focused on a company's net income or earnings. These items can relatively easily be manipulated by accounting adjustments. However, it is more difficult for a company to disguise its actual cash flows. Free cash flow may give a better impression of a firm's ability to earn money and pay out its profits in the form of a dividend.

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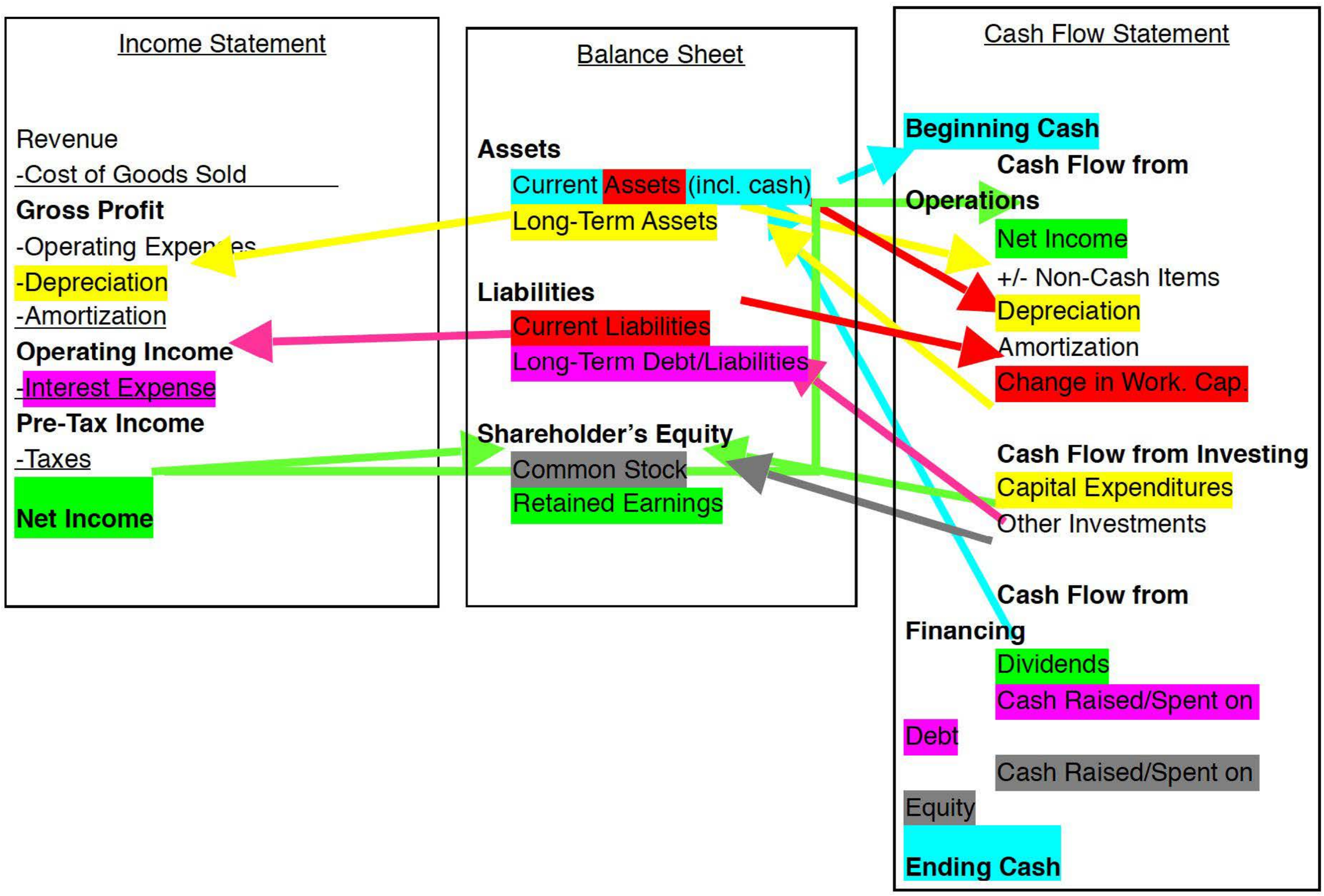
[Appendix D: Links Between Financial Statements]

Appendix D: Links Between Financial Statements



The provided Excel model also shows how the statements are interconnected.

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Appendix E: DCF Valuation and Financial Statement Links

See attached spreadsheet for a sample DCF analysis with a full Balance Sheet, Income Statement, and Cash Flow Statement, as well as a comparable company valuation analysis and Black-Scholes option pricing model.

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