Finance Technical Mock Interviews 101

## Today’s discussion

- Interview format
- Technical questions: Accounting
- Technical questions: Valuation
- Industry-based questions
- Other resources


## Most investment banking interviews follow similar formats, and most banks are looking for similar skills

Banking interviews are short and have both qualitative and quantitative portions



- Qualitative: behavioral, random questions
- Quantitative: technical (accounting and finance)
- 30 minutes (occasionally 45 minutes)
- Typically 1-on-1 or 2-on-1
- Interviews mostly be current investment bankers

Banks are looking for enthusiasm, communication skills, analytical capacity and cultural fit


- Interest in investment banking as role (and thus willingness to learn and work long hours)
- Test through technical and banking knowledge


## Communication

 skills- Verbal and written communication style (banking is more writing than most realize!)


## Analytical capacity



- Personality and workstyle similar
- Quantitative aptitude (willingness to learn and comfort with numbers) to that of other successful bankers
- "Airport" test (subject to interviewer interpretation)


## Investment banking interviews typically consist of similar types of questions



- "Tell me about yourself" "Walk me through your resume"
- Opportunity to go through your full story, start the interview with the narrative you want
- "Why banking" "Why this bank" "Why this city" "Why this group"
- Opportunity to show your knowledge of the specific bank or team, and highlight why your passionate about them
- "Tell me about a time when..."
- Opportunity to tell stories that paint you in the best light and highlight your specific strengths / skills
- "Walk me through the financial statements" "How do you value a company"
- Opportunity to show your enthusiasm for banking by knowing the basics of the quantitative aspects of the job
- Set of questions that are hard to predict and vary by interviewer
- Include strengths / weaknesses, level of commitment, sell yourself, and long term future questions
- "Do you have any questions for me"
- Questions from you to the interviewer
- Important to not end on a bad note


## Technical questions: Overview

- Preparing for technical questions is important to show knowledge and passion for investment banking
- Even if they like you, a poor performance on the technical component will hurt your chances
- Conceptual understanding is most important
- Two primary types of questions will be Accounting and Valuation
- Others include Enterprise/Equity value, Merger Model and occasionally LBO


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## Top accounting concepts to know

1. The three financial statements and what each one means
2. How changes in individual items on each of the financial statements affect one another and why
3. What individual line items on the statements mean (i.e. Goodwill, shareholders equity, etc.)
4. Different methods of accounting (cash-based vs. accrual) and when revenue and expenses are recognized
5. When to expense something and when to capitalize it

## What are the three financial statements?

- Income Statement
- Cash Flow Statement
- Balance Sheet


## Income Statement

- The Income Statement (IS) shows the company's revenue and expenses, taxes and after-tax profit 1
- Shows a company's performance over a period of time
- To appear on the income statement, a line item must:
- Correspond to the period shown on the statement
- Affect the company's taxes
- i.e. interest paid on debt is tax-deductible so it appears on the IS... but repaying debt principal is not tax-deductible, so it does not appear on the IS.



## Income Statement

1. Revenue and Cost of Goods Sold (COGS):

Revenue is the value of the products/services that a company sells in the period (Year 1 or Year 2), and COGS represents the expenses that are linked directly to the sale of those products/services.
2. Operating Expenses: Items that are not directly linked to product sales - employee salaries, rent, marketing, research and development, as well as non-cash expenses like Depreciation and Amortization.
3. Other Income and Expenses: This goes between Operating Income and Pre-Tax Income. Interest shows up here, as well as items such as Gains and Losses when Assets are sold, Impairment Charges, Write-Downs, and anything else that is not part of the company's core business operations.
4. Taxes and Net Income: Net Income represents the company's "bottom line" - how much in after-tax profits it has earned. Net Income = Revenue - Expenses - Taxes.



## Balance Sheet

Let's think about a relatable example. Your favorite Aunt Susie owns a home. When thinking about her balance sheet:

| Assets |  | Liabilities |  |
| :---: | :---: | :---: | :---: |
| Personal investments | \$50,000 | Mortgage | \$380,000 |
| Cash | \$30,000 | Equity |  |
| House | \$500,000 | After-tax savings from earnings | \$200,00 |
| Total Assets = \$580,000 |  | Total Liabilities = \$580,000 |  |

Just like a company's balance sheet, your personal balance sheet must always balance.

## Cash Flow Statement

- The Cash Flow Statement (CFS) tracks changes in a company's cash balance
- Shows flows over a period of time
- Exists for 2 primary reasons
- Non-cash revenues and expenses on the IS need to be adjusted to show change in cash balance
- Show additional cash inflows and outflows not yet on the IS

| Cash Flow Statement |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | ear 1 |  | ear 2 |
| Operating Activities: |  |  |  |  |  |
| Net Income: |  | \$ | 576 | \$ | 627 |
| Non-Cash Expenses \& Other Adjustments: |  |  |  |  |  |
| Depreciation: |  |  | 20 |  | 25 |
| Stock-Based Compensation: |  |  | 10 |  | 15 |
| Amortization of Intangibles: |  |  | 15 |  | 20 |
| (Gain) / Loss on Sale of PP\&E: |  |  | (1) |  | - |
| Changes in Operating Assets \& Labilities: |  |  |  |  |  |
| Accounts Receivable: |  |  | 5 |  | (2) |
| Prepaid Expenses: |  |  | (2) |  | 3 |
| Accounts Payable: |  |  | (3) |  | 2 |
|  |  |  | 4 |  | (5) |
| Accrued Expenses: |  |  | 1 |  | (3) |
| Deferred Revenue: |  |  | 9 |  | 5 |
| Cash Flow from Operations: |  |  | 634 |  | 687 |
|  |  |  |  |  |  |
| Investing Activities: |  |  |  |  |  |
| Purchase Short-Term Investments: |  |  | (2) |  | (1) |
| Sell Short-Term Investments: |  |  | 3 |  | 5 |
| Purchase Long-Term Investments: |  |  | (4) |  | (5) |
| Sell Long-Term Investments |  |  | 1 |  | 2 |
|  |  |  | (10) |  | (15) |
| PP\&E Sale Proceeds: |  |  | 5 |  | 2 |
| Cash Flow from Investing: |  |  | (7) |  | (12) |
|  |  |  |  |  |  |
| Financing Activities: |  |  |  |  |  |
| Dividends Issued: |  |  | (10) |  | (11) |
| Issue Long-Term Debt: |  |  | 4 |  | 5 |
| Repay Long-Term Debt: |  |  | (1) |  | (2) |
| Issue Short-Term Debt: |  |  | 2 |  | 3 |
| Repay Short-Term Debt: |  |  | (1) |  | (2) |
| Repurchase Shares: |  |  | (5) |  | (5) |
| Issue New Shares: |  |  | 6 |  | 6 |
| Cash Flow from Financing: |  |  | (5) |  | (6) |
|  |  |  |  |  |  |
| Beginning Cash: |  | \$ | 100 | \$ | 722 |
|  |  |  |  |  |  |
| Increase / Decrease in Cash: |  | \$ | 622 | \$ | 669 |
| Cash \& Cash Equivalents: |  | \$ | 722 | \$ | 1,391 |

## Cash Flow Statement

1. Cash Flow from Operations (CFO) - Net Income from the Income Statement flows in at the top. Then, you adjust for noncash expenses, and take into account how operational Balance Sheet items such as Accounts Receivable and Accounts Payable have changed.
2. Cash Flow from Investing (CFI) Anything related to the company's investments, acquisitions, and PP\&E shows up here. Purchases are negative because they use up cash, and sales are positive because they result in more cash.
3. Cash Flow from Financing (CFF) - Items related to debt, dividends, and issuing or repurchasing shares show up here.


## Primary questions on the three financial statements

- Walk me through the three financial statements?
- How do the three financial statements link together?
- If I were stranded on a desert island, only had 1 statement and I wanted to review the overall health of a company - which statement would I use and why?
- Let's say I could only look at 2 statements to assess a company's prospects - which 2 would I use and why?


## Walk me through the three financial statements? How do the three financial statements link together?



Don't forget to flip the signs of certain items!
(i.e. Gains and Losses)



## Walk me through the three financial statements.

The 3 major financial statements are the Income Statement, Balance Sheet and Cash Flow Statement.

The Income Statement shows the company's revenue and expenses over a period of time, and goes down to Net Income, the final line on the statement.

The Balance Sheet shows the company's Assets - its resources - such as Cash, Inventory and PP\&E, as well as its Liabilities - such as Debt and Accounts Payable - and Shareholders' Equity - at a specific point in time. Assets must equal Liabilities plus Shareholders' Equity.

The Cash Flow Statement begins with Net Income, adjusts for non-cash expenses and changes in operating assets and liabilities (working capital), and then shows how the company has spent cash or received cash from Investing or Financing activities; at the end, you see the company's net change in cash.

## How do the three financial statements link together?

1. Net Income from the bottom of the IS becomes the top line of the CFS.
2. Add back non-cash expenses from the IS (and flip the signs of items such as Gains and Losses).
3. Reflect changes in operational BS line items - if an Asset goes up, cash flow goes down and vice versa; if a Liability goes up, cash flow goes up and vice versa.
4. Reflect Purchases and Sales of Investments and PP\&E in Cash Flow from Investing.
5. Reflect Dividends, Debt issued or repurchased, and Shares issued or repurchased in Cash Flow from Financing.
6. Calculate the net change in cash at the bottom of the CFS, and then link this into cash at the top of the next period's BS.
7. Update the BS to reflect changes in Cash, Debt, Equity, Investments, PP\&E, and anything else that came from the CFS.

## Watch out for these common pitfalls:

- BS doesn't balance - it must always balance
- Duplicating effects of BS changes on the CFS
- Reflect each Balance Sheet item once and only once on the Cash Flow Statement, and vice versa.
- Affect an increase/decrease in assets or liabilities have on the BS
- If an Asset goes up, cash flow goes down; if a Liability goes up, cash flow goes up, and vice versa.
- Forgetting to flip signs on the CFS
- Common example is Gains or Losses on Asset Sale: Must list in both cash flow from operations and cash flow from investing because you are re-classifying the cash flow. You subtract it from CFO and instead include it as part of the full selling price of the assets in CFI instead.
- Accounts payable vs. Accrued expenses
- Mechanically, they are the same: Liabilities on the BS used when you've recorded an IS expense for a product/service you have received, but have not yet paid for in cash. The difference is that Accounts Payable is mostly for one-time expenses with invoices, such as paying for a law firm, whereas Accrued Expenses is for recurring expenses without invoices, such as employee wages, rent, and utilities
- Accounts receivable vs. Deferred revenue
- Primary differences: (1) Accounts Receivable has not yet been collected in cash from customers, whereas Deferred Revenue has been (2) Accounts Receivable is for a product/service the company has already delivered but hasn't been paid for yet, whereas Deferred Revenue is for a product/service the company has not yet delivered
- Accounts Receivable is an Asset because it implies additional future cash whereas Deferred Revenue is a Liability because it implies the opposite.

If I were stranded on a desert island only had 1 statement to review the overall health of a company - which statement would I use and why?

## The Cash Flow Statement!

- It gives a true picture of how much cash the company is actually generating. This is ultimately the \#1 thing you care about when analyzing the financial health of any business its true cash flow
- Income Statement is misleading because it includes noncash expenses and excludes actual cash expenses such as Capital Expenditures


## If I had only two statements to use... which would I

 use and why
## Income Statement and Balance Sheet!

- You can create a rough cash flow statement from both of those (assuming you have "Beginning" and "Ending" BSs that correspond to the same period the IS is tracking)


## Changes on the three financial statements

- Single Step:
- Walk me through how depreciation going up by \$10 would affect the three statements?
- Multi-step:
- A company makes a $\$ 100$ cash purchase of equipment on Dec. 31. How does this impact the three statements this year and next year?

Helpful Tip - Use the following order when walking throw these types of questions:

1. Income Statement 2. Cash Flow Statement
2. Balance Sheet

## Walk me through how depreciation going up by \$10 would affect the three statements?

- Note: Before starting, always confirm what tax rate to use, given recent changes to corporate tax - fair to assume 20\%
- IS: Operating income and pre-tax income would decline by $\$ 10$, tax shield of $+\$ 2$, net income is down - $\$ 8$
- CFS: Net income at top goes down by $\$ 8$, but $\$ 10$ depreciation is a non-cash expense so gets added back. Overall cash flow from operations (CFO) goes up by $\$ 2$. No other changes - net change in cash is $+\$ 2$
- BS: PPE decreases by $\$ 10$ on asset side (depreciation), cash is $+\$ 2$ from changes in CFS, so Assets down by $\$ 8$. Net income was down - $\$ 8$, so is shareholders equity on Liabilities and Equity side.
- Balance sheet is now balanced!

Walk me through how depreciation going up by \$10 would affect the three statements?

- Intuition: We save taxes on all non-cash charges such as depreciation
- Further testing: ask yourself the same question with different numbers, decreasing depreciation or with changes in different line items, i.e. accrued expenses, accounts receivable, inventory, etc.
- Feeling confident? Try out the next multi-step example to see how comfortable you are with accounting!


## Multi-Step Scenario

1. Apple is buying $\$ 100$ worth of new iPad factories with debt. How are all 3 statements affected at the start of Year 1?
2. In Year 2, Debt is high-yield, so no principal is paid off, and assume an interest rate of $10 \%$. Also assume the factories Depreciate at a rate of $10 \%$ per year. What happens now?
3. At end of Year 2, the factories break down and their value is written down to $\$ 0$. The loan must also be paid back now. Walk me through how the 3 statements ONLY from the start of Year 2 to the end of Year 2.
4. Apple is buying $\$ 100$ worth of new iPad factories with debt. How are all 3 statements affected at the start of Year 1?

- IS: At the start of Year 1, no effect.
- CFS: $\$ 100$ spend on capital expenditures, would decrease CFI -\$100; $\$ 100$ cash inflow from debt financing would increase CFF $+\$ 100$; No change in cash.
- BS: On asset side, PPE has increased $+\$ 100$ from factory purchases; On liabilities side, debt has increased $+\$ 100$
- BS balances!

2. In Year 2, Debt is high-yield, so no principal is paid off, and has 10\% interest rate. Also assume the factories depreciate at a rate of $10 \%$ per year. What happens now?

- At the start of Year 2, Apple must pay interest expense and record depreciation.
- IS: Operating income decreases $\$ 10$ (10\% depreciation on $\$ 100$ factories) and the additional $\$ 10$ in interest expense, decreases pre-tax income by $\$ 20$. Assuming $20 \%$ tax, net income falls by $-\$ 16$.
- CFS: Net income at top is down - $\$ 16$, add back $\$ 10$ depreciation in CFO (non-cash expense); no further changes, so net change in cash is -\$6
- BS: On asset side, Cash is $-\$ 6$, PPE is $-\$ 10$ (depreciation), bringing total assets -\$16. On liabilities, shareholder's equity - $\mathbf{\$ 1 6}$ (linked to net income changes)
- BS balances!
- Note: Debt number doesn't change since we assume none of the principal has been paid back.

3. At end of Year 2, the factories break down and their value is written down to $\$ 0$. The loan must also be paid back now. Walk me through how the 3 statements ONLY from the start of Year 2 to the end of Year 2.

- After 2 years, given $10 \%$ annual depreciation, the factories are valued at $\$ 80$. This is the value we need to write down.
- IS: Operating income decreases $\$ 90$ ( $10 \%$ depreciation on $\$ 100$ factories + \$80 write-down), and the additional \$10 in interest expense. Thereby decreasing pre-tax income by $\$ 100$. Assuming 20\% tax, net income falls by $-\$ 80$.
- CFS: Net income at top is down -\$80; in CFO, add back $\$ 90$ depreciation + write-down in CFO (non-cash expense); in CFF, -\$100 due to paying back the loan principle; so net change in cash is -\$90
- BS: On asset side, Cash is - $\$ 90$, PPE is $-\$ 90$ (depreciation + write-down), bringing total assets $-\$ 180$. On liabilities, debt is $-\$ 100$ (paid-off), shareholder's equity is $\mathbf{-} \mathbf{\$ 8 0}$, thereby total liabilities $-\$ 180$.


## Common Pitfalls

- Recognizing a change in inventory on the IS
- Not understanding the difference between certain line items
- Forgetting effect of tax
- When phrasing changes, i.e. "A company sells some PP\&E for $\$ 120$ but it's worth $\$ 100$ on its BS. Walk me through..."
- When in doubt, always ask a question to clarify!


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## Top Valuation questions

- How can you value a company? What are the three main valuation methodologies?
- Which methodology gives the highest value?
- How do you present these to a client?
- What is a DCF?
- How do you calculate free cash flow (FCF)? Walk me through how you get from Revenue to FCF?
- How do you calculate WACC?
- How do you calculate cost of equity?
- What is beta?
- How do you calculate Terminal Value (TV)?
- How would you value this [random object]?


## How can you value a company? What are the three main valuation methodologies?

There are three primary ways to value a company:

1. Comparable companies analysis
2. Precendent transaction analysis
3. Discounted Cash Flow (DCF)
4. Leveraged Buyout (LBO)
5. Sum-of-the-parts
6. Merger consequences analysis


A relative valuation uses financials from other public companies and recent M\&A deals to estimate what the company you are valuing may be worth.

For an intrinsic valuation you can: (1) Estimate future cash flows and discount them back to their present value (money today is worth more than money tomorrow), or (2) Value the firm's assets and assume the firm's total value is linked to its adjusted asset value minus its liabilities

Topics you must understand about a DCF analysis

1. What it is and be able to walk through it
2. How to calculate and project Free Cash Flow (FCF)
3. How to calculate the discount rate, and apply WACC and cost of equity
4. How to calculate the Terminal Value, what it is and how it affects a DCF

## What is a DCF?

In a DCF analysis, you value a company with the Present Value of its Free Cash Flows (FCF) plus the Present Value of its Terminal Value:

1. Project a company's FCF over a 5-10 year period
2. Calculate the company's Discount Rate, usually using WACC (Weighted Average Cost of Capital).
3. Discount and sum up the company's Free Cash Flows.
4. Calculate the company's Terminal Value using either the Multiples Method or Gordon's Growth (Perpetuity) Method
5. Discount the Terminal Value to its Present Value.
6. Add the discounted Free Cash Flows to the discounted Terminal Value

See where these steps happen on an actual DCF on the next page!

## Lemonade Stand DCF



| Assumptions |  |
| :---: | :---: |
| Expected revenue growth | 10\% |
| Effective tax rate | 10\% |
| Discount rate (WACC) | 10\%\| |
| Terminal Growth rate $-=-\frac{10 \%}{2 \%}$ |  |


| Operating Expenses |  |
| :--- | ---: |
| Uber (\$6/day) | $\$ 540$ |
| Payroll (\$50/day) | $\$ 4,500$ |
| Park license (\$150/summer) | $\$ 150$ |
| Total | $\$ 5,190$ |

## Why do you calculate a company's FCF? How?

A company's FCF closely corresponds to the actual cash flow that the investor would receive each year if $s /$ he bought the entire company. To calculate this:

1. Project a company's revenue growth (\% expected to grow over projected period)
2. Assume operating margin to calculate EBIT or operating income
3. Apply effective tax rate to calculate net operating profit after tax (NOPAT)
4. Use CFS to project 3 key items that impact FCF: non-cash charges (depreciation and amortization), changes in operating assets and liabilities (net working capital), and capital expenditures

- Add back non-cash charges
- Subtract if Assets increase more than liabilities
- Subtract capital expenditures

5. Now you have your Unlevered FCF!

## Now what?.....Right, discount the FCFs to the present value. How?

1. What discount rate would you use?

- Weighted Average Cost of Capital (WACC)

2. What is WACC?

- Calculates the company's cost of debt and equity, weighted based on it's capital structure
- WACC $=$ cost of debt *(\% debt) $)^{*}(1-$ tax rate $)+$ cost of equity*(\% equity) + Cost of Preferred * (\% Preferred)

3. What is the cost of debt?

- It's interest rate on it's debt

4. What is the cost of equity?

- Cost of equity = risk-free rate + market (equity) risk premium*beta


## What next?.....Terminal value....How do you calculate that?

Two different methods: Multiples method and Gordon Growth Method

1. Multiples: Often used and based on public comps. EBITDA multiple of ? $x$ - would often provide a range
2. Gordon Growth or Perpetual Growth - assumes the company operates indefinitely and sums future cash flows

- TV = Final year FCF *(1 + Terminal FCF Growth Rate) / (Discount Rate - Terminal FCF Growth Rate).
- What would you use for Terminal growth rate? It should be very low - less or equal to country's GDP growth rate or rate of inflation

Then...

Add PV of TV to PV of FCF in the projected period to get your final valuation!

Potential follow-ups questions:

- Which components of a DCF tend to have the greatest impact on the valuation?
- Discount rate and terminal value


## Additional rules to remember / to test on regarding DCF components

## Effect on Cost of Equity

个 Smaller companies and companies in fast growing industries or countries have higher expected returns
T Additional debt because it increases risk

- Additional equity because it decreases percentage of debt


## Effect on WACC

个 Smaller companies and companies in fast growing industries or countries have higher expected returns

T Higher interest rate because it increases cost of debt
Additional debt because debt is less expensive than equity

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## Industry-based questions

- Explain the sub-prime mortgage crisis. What happened?
- Let's say you had $\$ 10$ million to invest in anything. What would you do with it?
$\checkmark$ First ask what are the investor's goals - base response on investment horizon
- If you owned a small business and were approached by a larger company about an acquisition, how would you think about the offer, and how would you make a decision on what to do?
- would you do with it?
$\checkmark$ Key terms to consider are: price, form of payment (cash, stock, debt), future plans for company
- What trend or company in the industry have you been following?
$\checkmark$ Do research or specific industry beforehand
$\times$ Describe something irrelevant, don't explain the "why" or impact on the market
- Talk about a company you admire. Why?
$\checkmark$ Focus on qualities investors would find appealing
$\times$ Don't choose brand name, i.e. Apple, Google, Amazon, etc.


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## Additional Resources



- Blog with recruiting advice for breaking into investment banking
- Several articles on networking (how to approach information sessions, what to ask during informational interviews, etc.)
- Additional resources for interview prep and non-IBD recruiting as well
- Forum with dedicated rooms for banking, sales and trading, etc.
- Significant amount of quality content and advice - but have to weed through equally significant amount of bad content and advice; be careful!
- Career advising appointments can be used to discuss networking approach and strategy
- Mock interviews with career services staff for in-person feedback
- Countless articles, books and websites dedicated to advice on networking and interviewing
- Networking can be used in more contexts than just undergraduate recruiting - many of these resources can help!

