BANKING AT MICHIGAN: Investment Banking Guide

Behavioral, Fit & Technical Questions

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Disclaimer and Usage

This guide was created in the hopes of providing education and insight for any student interested in pursuing a career in investment banking.

This guide is non-exhaustive and should be used in conjunction with other resources. The author(s) do(es) not take responsibility for the accuracy of any information provided in this guide.

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ABOUT BANKING AT MICHIGAN

Banking at Michigan

Banking at Michigan is a student-led project at the University of Michigan aimed at providing education, guidance and resources to any student interested in investment banking

INTERVIEW RESOURCES

Resources for Preparation

- Overview/General Research
  - Duke University: Investment Banking Demystified
  - Mergers & Inquisitions: Investment Banking
  - Street of Walls: Investment Banking
  - Vault: Best Banking Firms
- Interview Preparation
  - BIWS: 400 Questions You Need to Know
  - Street of Walls: Paper LBO
  - Rosenbaum & Pearl
  - Wall Street Oasis: Interview Guides
  - Western Investment Club: Recruiting Guide

BEHAVIORAL/FIT QUESTIONS

Behavioral Questions

- Tell me about yourself in 2-3 minutes.
- Why investment banking?
- Why investment banking **at our firm specifically**?
- What does our firm do?
- Where do you see yourself in 5-10 years?
- Which other firms are you interviewing with?
- What typically goes in an investment banking pitch deck?

Behavioral Questions

- Tell me your three greatest strengths & weaknesses.
  - How would your friends describe you in three words?
  - How have your past experiences prepared you for investment banking?
  - Why are you a strong fit for investment banking?
  - Why should we accept you versus all the individuals who we have interviewed who said we should accept them?
  - *All of these are different ways of phrasing the “strengths” question.*

Behavioral Questions

- Have stories for the following “scenarios”
  - Success/Failure
  - Successfully lead a team
  - Overcame a challenge
  - Turned around a team/worked with a difficult teammate
  - Performed under pressure/struggled with a deadline
  - Ethical dilemma
  - Disagreed with someone senior
  - Incorporated diversity into a team or challenge
  - Solved a complex problem using data
  - Quick decision with imperfect information

Behavioral Questions

- Tell me about a recent deal you have followed?
  - Overview of parties involved
  - Financial Details
  - Company Rationale
  - Personal Opinion
- It is recommended to have at least 2 recent deals in the news, with one being specific to the firm
- Be prepared for follow-up questions and make sure you have an informed opinion

ACCOUNTING QUESTIONS

Accounting

- Recommended structure for “walk me through the 3 statements” questions
    - Starting on the Income Statement…
    - Moving on to the Statement of Cash Flows…
    - Finally, on the Balance Sheet…
    - … and both sides of the Balance Sheet balance

Accounting

- Walk me through the 3 financial statements and how they are linked together.
- Name 2 scenarios that can cause Shareholders' Equity to be negative.
- How can a company with a positive EBITDA go bankrupt?
- Explain Operating Working Capital.
- Why is Deferred Revenue a liability if you are earning money?

Accounting

Assume 30% tax rate

- Walk me through 3 statements with...
  - $120 decrease in depreciation
  - $50 increase in stock-based compensation
  - $10 interest expense (5% cash interest, 5% PIK interest) and $5 interest income
  - $20 decrease in Deferred Revenue
  - Debt write down of $100 with 5% interest attached

Accounting

Assume 20% tax rate

- Multi-step
  - Year 0: Buy PP&E for $100 using Debt. Walk through the 3 statements.
  - Year 2: PP&E depreciates over 10-year period using straight-line depreciation. After two years, you sell the PP&E for $120. Assume depreciation has been accounted for on the financial statements. Walk through the 3 statements after the sale of PP&E.

Accounting

Assume 30% tax rate

- Multi-step
    - Year 0: Buy Land for $90 using cash on hand. Walk through the 3 statements.
    - Year 2: Straight-line depreciation occurs over a 10-year period. After two years, you sell the land for $90. Walk through the 3 statements after the sale of land.

Accounting

Assume 30% tax rate

- Multi-step
  - You raise $100 debt with 5% interest and 10% yearly principal repayment. You use that money to purchase $100 of short-term assets that have 10% yearly interest income attached.
  - Right when you raise the debt and purchase short term assets, walk me through the 3 statements.
  - After one year, walk me through the 3 statements.

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ENTERPRISE & EQUITY VALUE QUESTIONS

Enterprise Value/Equity Value

- Formula for Enterprise Value, and why do you add NCI/subtract cash?
- Difference between Equity Value versus Shareholders' Equity?
- How does ____ affect Enterprise Value?
    - Raise $200m in Debt, use cash to buy a new piece of equipment.
    - Issue $200m in Equity for an IPO.
- Two companies are 100% comparable. Why might one trade at a premium (e.g. higher EV/EBITDA multiple)?
- Would you rather buy a company with a high or low P/E multiple?
- What are some multiples you could use for a company with a negative Net Income?

Enterprise Value/Equity Value

- Company A and Company B have identical EV/EBITDA. Company A has a higher P/E multiple. Why might this be the case?
- You have a company with an EV/Revenue of 2x and an EV/EBITDA of 10x. What is the EBITDA margin?
- A company has a stock price of $20 a share and a P/E of 20x (so EPS is 1). The company has 10M shares outstanding. How does a 2-for-1 stock split affect EV?
- A company has 10,000 shares at $20 a share. There are 100 call options at an exercise price of $10, 50 restricted stock units (RSUs) and 100 convertible bonds at a price of $10 and par value of $100. What is the diluted equity value?

VALUATION QUESTIONS

Valuation

- What are the 4 main valuation methodologies? Rank them from highest to lowest and explain.
- What are some flaws of comparable companies and precedent transactions?
- What metrics do you look at for comparable companies? What additional metric do you look at for precedent transactions?
- What would a situation be where precedent transactions is less than comparable companies?
- Why does a DCF *almost always* produce a higher valuation than an LBO?
- Is a company with a 50x P/E overvalued or undervalued? Why?

Valuation

- What are some other valuation methodologies—other than the main 4?
- How would you value a peach tree?

DCF QUESTIONS

Discounted Cash Flow

- What is a DCF/can you walk me through a DCF in under 60 seconds?
- Why do you typically use 5-10 years for the projection period?
- How would you change a DCF to value a highly speculative technology company?
- Key assumptions/drivers of a DCF?
- Tell me 3 places where taxes affect a DCF.
- If you are valuing a coal mine company, would you use the Gordon Growth Method or the Multiples Method to calculate the TV? Explain.
- A company buys a factory for $100 in its 4th year. How would the DCF/Enterprise Value change for the company?
- Do you use planned or targeted capital structure in WACC?

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Discounted Cash Flow

- What is FCF? Why do we use it in a DCF?
- Walk me from Revenue to FCF for Unlevered and Levered FCF.
- What is WACC, conceptually? How do you calculate it?
  - How do you calculate Cost of Equity? Cost of Debt? Cost of Preferred Stock?
  - What would you use as your discount rate if you are using Levered FCF? Why?
- What is Beta, and why do you have to unlever and relever it?
- When would you rather use the Multiples Method vs. the Gordon Growth Method (GGM)?
- How would you calculate the long-term growth rate for the GGM?

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LBO (LEVERAGED BUYOUT) QUESTIONS

LBOs

- What is an LBO/can you walk me through an LBO?
- What makes a strong LBO candidate? (should know at least 5, and know which one is the most important one & why)
- 3 main drivers of IRR? (should know at least 5, but know the main 3)
- Why do financial sponsors pay less than a strategic buyer?
- Different types of debt you could raise in an LBO?
- What is a dividend recapitalization? What is its effect on IRR?
- What is PIK interest? Why may a distressed company prefer PIK interest?

LBOs

- What happens to the Balance Sheet and IS after an LBO?
- What is a revolver and why is it the cheapest form of debt?
- Paper LBOs may come up during an interview
  - Go through the "Street of Walls Paper LBO" here (should only take 1-2 hours)
  - Going through one of these will go a long way in helping you understand the mechanics of a LBO

MERGER MODELS QUESTIONS

Merger Models

- Walk me through a merger model.
- What are the two types of buyers?
- Why would a company buy another company? How would this reasoning differ for the two types of buyers?
- 3 main financing methods and why use one over another?
- When would you prefer revenue synergies over cost synergies, and when would you be indifferent? (think of the two types of revenue synergies)
- Why do we look at EPS & accretion/dilution?
- Difference between Mergers vs. Acquisitions?

Merger Models

- What are the 5 main acquisition affects?
- What happens to the Balance Sheet and Income Statement after M&A?
- Company A buys Company B. Company A has a higher P/E ratio than Company B. Would the deal be accretive or dilutive if:
  - The deal is all stock
  - The deal is all debt/all cash
- What is the combined equity value of a company if the deal is not financed with any stock?
- What are Deferred Tax Liabilities and Deferred Tax Assets? Why do they sometimes get created in M&A transactions?

MISC.

Miscellaneous

- Would you rather us hand you $1,000 today or $100 every year into perpetuity?
- What is the Beta of a gambling ring?
- What is the P/E of cash?
- 5 things a company can do with cash?
- 2 ways you can return cash to shareholders? Why would you prefer one over the other?
- Explain the concept behind the time value of money to a 5 year old without talking about money.

Miscellaneous

- You are evaluating two laundry mat companys. One owns the equipment, while the other leases the equipment. Which one would you rather buy and why?
- How do you value a company with no financials or comparables?

Miscellaneous

The following are rarely asked in IB interviews, but product groups are more likely to ask these

- What are the following?
  - Firm’s current stock price, market cap, P/E and EPS?
  - DOW, NASDAQ, S&P and RUSSELL 2000 indexes?
  - 10-year and 30-year U.S. treasury yields?
  - Federal funds rate and impact on economy?
  - U.S. GDP/growth, inflation and unemployment?
  - U.S. corporate tax rate?
  - Price of commodoties (gold, silver, oil)?

Miscellaneous

- Pitch me a stock (very rare in IB, though not unheard of)
    - More relevant to those who have past experience with valuation
    - If no prior experience, can prepare a general “buy” recommendation—but no need for a specific “price target”

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FORMULAS

Formulas

- EV and Equity Value
    - Equity Value = Price per share * # Shares
        - Also known as “market cap”; cannot be negative
    - Enterprise Value = Equity Value + Debt + Preferred Stock + Noncontrolling Interests - Cash
    - Per Share Value = Equity Value/# Shares
    - Convertible Bonds (in the money)
        - Value of Convertible Bonds/Par Value = # of convertible bonds
        - Par Value/Price = # of shares per convertible bond
        - # of shares per convertible bond * # of convertible bonds = new shares created

Formulas

- Valuation
  - EBIT = Operating Income = Revenue - COGS - Operating Expenses
  - P/E = Price per Share/EPS = Equity Value/Net Income
  - EPS = Net Income/Shares Outstanding
- DCF
  - Unlevered FCF = EBIT(1 - tax rate) + Non-Cash expenses - Change in NWC - CapEx
    - Excludes interest and debt
  - Levered FCF = Net Income + Non-cash expenses - Change in NWC - CapEx - Mandatory Debt Repayments
    - Alternatively, Levered FCF = CFO - CapEx
    - Includes interest and debt

Formulas

- DCF
    - Terminal Value (PV of company's FCF from final year into infinity, as of final year)
        - Multiples Method: Apply exit multiple to the company's Year 5 EBITDA, EBIT or Free Cash Flow
        - Gordon Growth: TV = Final Year FCF * (1 + g)/(r - g)
    - Unlevered Beta = Levered Beta/(1 + (1 - tax rate) * (Debt/Equity))

Formulas

- DCF
  - WACC = (Cost of Equity * % Equity) + (Cost of Debt * % Debt * (1-Tax Rate)) + (Cost of Preferred Stock * % Preferred Stock)
  - Cost of Equity (using CAPM) = RFR + Levered Beta * ERP
    - RFR = Risk-free rate (usually 10-year or 30-year U.S. Treasury Yield)
    - ERP = Equity-risk premium
  - Cost of Equity (without CAPM) = (Dividends per Share/Share Price) + Growth Rate of Dividends
  - Cost of Debt = Interest Rate on Debt
  - Cost of Preferred Stock = Effective Yield on Preferred Stock

Formulas

- LBO
  - Purchase Price = EBITDA * Multiple
  - Initial Investor Equity = Acquisition Price * EBITDA Multiple * % Equity
  - Exit Enterprise Value = Exit EBITDA * exit multiple
  - Debt Remaining on Exit = Beginning Debt - Total FCF
  - Exit Equity Proceeds = Exit Enterprise Value - Debt Remaining on Exit
  - Rules of thumb
    - If a PE firm doubles its money in 5 years, that's a 15% IRR
    - If a PE firm triples its money in 5 years, that's a 25% IRR
    - If a PE firm doubles its money in 3 years, that's a 26% IRR
    - If a PE firm triples its money in 3 years, that's a 44% IRR

Formulas

- Merger Models
    - Cost of Cash = Foregone Interest Rate on Cash * (1-Buyer Tax Rate)
        - Buyer giving up interest on cash in future… can no longer earn interest on cash
        - Pay taxes on interest income
    - Cost of Debt = Interest Rate on Debt * (1 - Buyer Tax Rate)
        - Interest on debt is tax-deductible
    - Cost of Stock = Reciprocal of buyer's P/E multiple = E/P, or Net Income/Equity Value
        - Buyer's after-tax yield
    - Yield of Seller = Reciprocal of seller's P/E multiple (using purchase price, not current share price = Net Income/Equity Purchase Price)

Formulas

- Merger Models
  - Combined Net Income$_{actual}$ = Combined Net Income - (Price Paid * % Debt * Interest on Debt * (1-Buyer's Tax Rate)) - (Price Paid * % Cash * Foregone Interest on Cash * (1-Buyer's Tax Rate))
    - Adjusting for additional interest on debt and/or foregone interest on cash
    - In an all stock deal, this will just be the combined Net Income
  - Combined Equity Value = Buyer's Equity Value + Value of Stock Issued in Deal
  - Combined Enterprise Value = Buyer's Enterprise Value + Purchase Enterprise Value of Seller
  - Deferred Tax Liabilities = (PP&E & Fixed-Asset Write Ups & Newly Created Intangibles) * Buyer's Tax Rate

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"If you light a lamp for someone it will also brighten your own path."

Thank you to all of the individuals who offered supported and guidance throughout the recruitment process.

The hope is that this guide will continue to develop over the future as we add contributions from other students looking to pay forward all of the mentorship they have received.

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