Access the Rest of the Fundamentals Course

Financial Modeling Fundamentals, Module 10: M&A Deals and Merger Models – Interview Questions

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Interview Questions

Merger models and M&A deals can get complex, but most interview questions on these topics are **simple** and relate to the rationale for deals and the basic calculations.

Interviewers are *far* less likely to ask about the more advanced topics, such as the treatment of NOLs in M&A deals, and are *far* more likely to ask tricky questions about simpler subjects, such as how Enterprise Value and valuation multiples change.

So the interview questions in this guide reflect that reality: You need to know the fundamentals **very well** because the "difficult questions" relate to in-depth understanding of the core topics rather than the more advanced points.

M&A Concepts and Overview

Questions on accretion/dilution and calculations in M&A deals could come up, but you're also likely to get questions on **the concepts** and companies' motivations for acquiring other companies.

So don't put the cart before the horse.

If you don't understand these questions, your interviewers will never even get to the more advanced topics.

1. Why would one company want to buy another company?

One company will want to buy another company if it believes it will be better off after the acquisition takes place. For example:

- The Seller's **asking price** is less than its **Implied Value**, i.e. the Present Value of its future cash flows.
- The Buyer's expected **IRR** from the acquisition exceeds its **WACC**.

Buyers often acquire Sellers to save money via consolidation and economies of scale, to grow geographically or gain market share, to acquire new customers or distribution channels, and to expand their products.

Deals are also motivated by competition, office politics, and ego.

2. How can you analyze an M&A deal and determine whether or not it makes sense?

The qualitative analysis depends on the factors above: Could the deal help the company expand geographies, products, or customer bases, give it more intellectual property, or improve its team?

The quantitative analysis might include a **valuation** of the Seller to see if it's undervalued, as well as a comparison of the expected IRR to the Buyer's WACC.

Finally, EPS accretion/dilution is very important in most deals because few Buyers want to execute dilutive deals; investors focus tremendously on near-term EPS, so dilutive deals tend to make companies' stock prices decline.

3. Walk me through a merger model (accretion/dilution analysis).

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, 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.

4. Why might an M&A deal be 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.

5. How can you tell whether an M&A deal will be accretive or dilutive?

You compare the Weighted Cost of Acquisition to the Seller's Yield at its purchase price.

- **Cost of Cash** = Foregone Interest Rate on Cash * (1 – Buyer's Tax Rate)
- **Cost of Debt** = Interest Rate on New Debt * (1 – Buyer's Tax Rate)
- **Cost of Stock** = Reciprocal of the Buyer's P / E multiple, i.e. Net Income / Equity Value.
- **Seller's Yield** = Reciprocal of the Seller's P / E multiple, calculated using the Purchase Equity Value.

Weighted Cost of Acquisition = % Cash Used * Cost of Cash + % Debt Used * Cost of Debt + % Stock Used * Cost of Stock.

If the Weighted Cost is **less** than the Seller's Yield, the deal will be **accretive**, if the Weighted Cost is **greater** than the Seller's Yield, the deal will be **dilutive**.

6. Why do you focus so much on EPS in M&A deals?

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 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.

7. How do you determine the Purchase Price 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.

8. What are the advantages and disadvantages of each purchase method (Cash, Debt, and Stock) in M&A deals?

Cash tends to be the cheapest option; most companies earn little Interest Income on it, so they don't lose much by using it to fund deals. It's also fastest and easiest to close Cash-based deals.

The downside is that using Cash limits the Buyer's flexibility in case it needs the funds for something else in the near future.

Debt is normally cheaper than Stock but more expensive than Cash, and deals involving Debt take more time to close because of the need to find investors.

Debt also limits the Buyer's flexibility because additional Debt makes *future* Debt issuances more difficult and expensive.

Finally, Stock tends to be the most expensive option, though it can sometimes be the cheapest, on paper, if the Buyer trades at very high multiples.

It dilutes the Buyer's existing investors, but it also prevents the Buyer from paying any additional *cash* expense for the deal.

In some cases, the Buyer can also issue Stock more quickly than it can issue Debt.

9. How does an Acquirer determine the mix of Cash, Debt, and Stock to use in a deal?

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. An 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.

10. Which purchase method does a Seller prefer in an M&A deal?

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.

11. What's the impact of each purchase method in an M&A deal, and how do you estimate the Cost of each method?

The Cost of Cash is represented by the Foregone Interest on Cash: The Acquirer loses future projected Interest Income by using Cash to fund a deal. The Cost of Debt is represented by the Interest Expense on New Debt.

For both of these, you take the interest rate and multiply by (1 – Acquirer's Tax Rate) to estimate the after-tax costs.

The Cost of Stock is represented by the additional shares that get created in a deal and how those shares reduce the Combined Company's EPS. It's equal to the reciprocal of the Buyer's P / E Multiple, i.e. 1 / (Buyer's P / E multiple).

12. Isn't the Foregone Interest on Cash just an "opportunity cost"? Why do you include it?

No, it's **not** just an "opportunity cost" because the Acquirer's *projected* Pre-Tax Income already includes the Interest Income that the company *expects* to earn on its Cash balance.

So if an Acquirer expects $90 in Operating Income and $10 in Interest Income for a total of $100 in Pre-Tax Income, its projected Pre-Tax Income will **fall** if it uses Cash to fund the deal.

13. Isn't it a contradiction to calculate the Cost of Stock by using the reciprocal of the Acquirer's P / E multiple? What about the Risk-Free Rate, Beta, and the Equity Risk Premium?

It's not a contradiction; it's just a different way of measuring the Cost of Equity.

The "Reciprocal of the P / E Multiple" method measures Cost of Equity in terms of EPS impact, whereas the CAPM method measures it based on the stock's expected annual returns.

Neither method is "the correct one": You just use them in different contexts.

In most cases, regardless of the method you use, Equity will be the most expensive funding source for a company.

14. Why might an Acquirer choose to use Stock or Debt even if it could pay for the Seller in Cash?

The Acquirer might not necessarily be able to draw on its entire Cash balance if, for example, much of the Cash is in overseas subsidiaries or otherwise locked up.

Also, the Buyer might be preserving its Cash for a future expansion plan or Debt maturity.

Finally, if the Acquirer is trading at very high multiples – e.g., a 100x P / E multiple – then it might be cheaper to use Stock to fund the deal.

15. Are there cases where EPS accretion/dilution is NOT important? What else could you look at?

Yes, there are many cases where EPS accretion/dilution doesn't matter.

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.

16. How does a Merger differ from an Acquisition?

There's no mechanical difference in a merger model or the other analyses because **there's always a Buyer and Seller** in any M&A deal.

The difference is that in a Merger, the companies will be closer in size, while Buyer is significantly larger than the Seller in an acquisition.

100% Stock or majority-Stock deals are also more common in Mergers because similarly sized companies can rarely use Cash or Debt to acquire each other.

You'll also place more weight on methods such as the Contribution Analysis because 100% Stock deals are so common.

17. What are the main PROBLEMS with merger models?

First, EPS is not always a meaningful metric. Second, Net Income and cash flow are very different, so EPS-accretive deals might be horrible from a cash-flow perspective.

Third, merger models don't capture the risk inherent in M&A deals. 100% Cash deals almost always look accretive, even though the integration process might go wrong, legal issues might arise, and customers or shareholders might revolt.

Finally, merger models don't capture the qualitative factors of a deal such as cultural fit or management's ability to work together.

18. Why do most M&A deals fail?

Most deals fail because of the **human element** – there might be a cultural mismatch, the Buyer might not have uncovered something important in due diligence, or the Buyer might have had stupid reasons for doing the deal in the first place.

Also, the Buyer or Seller might underperform financially, which could turn an apparently attractive deal into a money-losing one.

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Accretion/Dilution Calculations

Questions on accretion/dilution math can be surprisingly tricky.

They're also far more **common** than questions on advanced topics because all bankers are familiar with accretion/dilution, but not as many know the specifics of 338(h)(10) deals.

1. Company A, with a P / E of 25x, acquires Company B for a purchase P / E multiple of 15x. Will the deal be accretive?

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%).

2. Walk me through the full math for the deal now.

Assume that Company A has 10 shares outstanding at a share price of $25.00, and its Net Income is $10.

It acquires Company B for a Purchase Equity Value of $150. Company B has a Net Income of $10 as well. Assume the same tax rates for both companies. How accretive is this deal?

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.

3. Company A now uses Debt with an Interest Rate of 10% to acquire Company B. Is the deal still accretive? At what interest rate does it change from accretive to dilutive?

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%.

4. What are the Combined Equity Value and Enterprise Value in this deal?

Assume the original 100% Stock structure, and that Equity Value = Enterprise Value for both the Buyer and Seller.

Combined Equity Value = Buyer's Equity Value + Value of Stock Issued in the Deal = $250 + $150 = $400.

Combined Enterprise Value = Buyer's Enterprise Value + Purchase Enterprise Value of Seller = $250 + $150 = $400.

5. How do the Combined EV / EBITDA and P / E multiples change if the purchase method changes?

The Combined EV / EBITDA stays the same regardless of the purchase method, but the Combined P / E multiple will change based on the Stock issued and the Cash and Debt used since those affect the Combined Net Income.

6. Without doing any math, what range would you expect for the Combined P / E multiple?

The Combined P / E multiple should be in between the Buyer's P / E multiple and the Seller's Purchase P / E multiple, so between 25x and 15x here.

If Company A is much larger than Company B, the Combined P / E multiple will be closer to the 25x of Company A. But if they're closer in size, the Combined P / E multiple will be in the middle of this range.

You *cannot* average the P / E multiples of both companies because they may be different sizes; a weighted average also won't work because the purchase method affects the combined multiple.

7. Now assume that Company A is twice as big financially, so its Equity Value is $500 and its Net Income is $20. Will a 100% Stock deal be more or less accretive?

The deal will be *less accretive*. The intuition is that the company that is **not** making the deal dilutive – the Buyer – now has a higher weighting in all the calculations.

Since Company A's P / E is the same, but Company A is significantly bigger, its lower Yield "drags down" the Combined EPS for the entire company.

The Combined P / E multiple will still be between 15x and 25x, but it will be closer to 25x because Company A is weighted more heavily.

8. Now do the math. What is the accretion/dilution in a 100% Stock deal?

The Buyer previously represented $250 / $400, or 63%, of the total company, but now it represents $500 / $650, or 77%, of the total company, so we'd expect the accretion to fall by around 10-15%.

Company A's share price is now $50.00, it still has 10 shares outstanding, and its Equity Value is $500. Its EPS is $20 / 10 = $2.00.

To acquire Company B, Company A must issue 3 additional shares since $150 / $50.00 = 3.

Since both companies have the same tax rate and no Cash or Debt was used, you can add together the Net Income figures: Combined Net Income = $20 + $10 = $30.

The new share count is 10 + 3 = 13, and $30 / 13 = $2.31. This is about 15% higher than the Buyer's standalone EPS ($0.15 is 15% of $1.00, and $0.30 is 15% of $2.00).

So it's about 10% lower than the 25% accretion when Company A was smaller.

9. Company A has a P / E of 10x, a Debt Interest Rate of 10%, a Cash Interest Rate of 5%, and a tax rate of 40%.

It wants to acquire Company B at a purchase P / E multiple of 16x using 1/3 Stock, 1/3 Debt, and 1/3 Cash. Will the deal be accretive?

Company A's After-Tax Cost of Stock is 1/10, or 10%, its After-Tax Cost of Debt is 10% * (1 – 40%) = 6%, and its After-Tax Cost of Cash is 5% * (1 – 40%) = 3%.

Company B's Yield is 1 / 16, or 6.25%.

The Weighted Cost of Acquisition is 10% * 1/3 + 6% * 1/3 + 3% * 1/3 = 3.33% + 2% + 1% = 6.33%.

Since the Weighted Cost is slightly **above** Company B's Yield, the deal will be **dilutive**.

10. Company A buys Company B using 100% Debt. Company B has a purchase P / E multiple of 10x and Company A has a P / E multiple of 15x.

What Debt interest rate is required to make the deal dilutive?

Company B's Yield is 1 / 10, or 10%, so the After-Tax Cost of Debt must be *above* that for the deal to be dilutive.

Assuming the company has a tax rate of 40%, 10% / (1 – 40%) = 16.667%, which you can round to "Nearly 17%."

That is an exceptionally high interest rate, so a 100% Debt deal would almost certainly be accretive.

11. Company A has an Equity Value of $1,000 and Net Income of $100. Company B has a Purchase Equity Value of $2,000 and Net Income of $50.

For a 100% Stock deal to be accretive, how much in synergies must be realized?

Company A's P / E is $1,000 / $100 = 10x, so its Cost of Stock is 10%. Company B's P / E is $2,000 / $50 = 40x, so its Yield is 1 / 40, or 2.5%.

Without synergies, this deal would be highly dilutive.

For the deal to turn accretive, Company B's Yield must exceed 10%. That means that its Purchase P / E multiple must be *below* 10x, which means its Net Income must be above $200 rather than $50.

So there must be **$150 in after-tax synergies** for this deal to be accretive. At a 40% tax rate, there must be $250 in pre-tax synergies.

12. An Acquirer has an Equity Value of $1 billion, Cash of $50 million, EBITDA of $100 million, Net Income of $50 million, and a Debt / EBITDA ratio of 2x. Peer companies have a median Debt / EBITDA ratio of 4x.

It wants to acquire another company for a Purchase Equity Value of $500 million. The Seller has a Net Income of $30 million, EBITDA of $50 million, and no Debt.

What's the best way to fund this deal?

The Acquirer would prefer to use its Cash balance to do this deal, but $50 million is likely close to the minimum balance for a company of this size. So this company is unlikely to use Cash.

The Acquirer's P / E multiple is 20x, so its Cost of Stock is 1 / 20, or 5%.

That's a fairly low Cost of Stock, so there's a chance that the company's After-Tax Cost of Debt *might* be higher (e.g., if the Interest Rate on Debt were above 8.33%).

However, there's no information on the Cost of Debt, so our best guess is that Debt is still cheaper than Stock.

The company could afford to boost its Debt / EBITDA from 2x to 4x since peer companies have leverage in that range.

The Combined Company has $150 million in EBITDA, and 4 * $150 million = $600 million.

The Acquirer has $200 million in Debt before the deal takes place, so it could afford to issue $400 million in additional Debt.

The remaining $100 million would be issued in Stock. If this company could use part of its Cash balance as well, the $100 million Stock portion would be reduced.

13. An Acquirer has an Equity Value of $500 million, Cash of $100 million, EBITDA of $50 million, Net Income of $25 million, and a Debt / EBITDA ratio of 3x.

Similar companies in the market have Debt / EBITDA ratios of 5x.

What's the BIGGEST acquisition this company might be able to complete?

You can't answer this question precisely without knowing the Target's Net Income and EBITDA, but you can make a rough estimate.

The Acquirer couldn't use its *entire* Cash balance to fund a deal, but it might be able to use a substantial portion of it, such as $50 million or $80 million.

It could afford to use leverage up to 5x EBITDA, which means that it could use $100 million in additional Debt to fund a deal. That number might change based on the Seller's Debt and EBITDA as well.

There's no limit on how much Stock the company could issue, but it would be unlikely to give up control just to make an acquisition, so $500 million in Stock is likely the maximum.

In reality, it probably wouldn't issue anything close to that amount of Stock.

A more realistic level might be about half its Current Equity Value ($250 million), or whatever amount turns the deal dilutive.

So the best answer is: "In theory, the Acquirer might be able to fund a deal for up to $650 to $700 million. But in reality, unless it wants to issue a massive amount of Stock, the maximum level would be closer to $400 to $650 million."

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Equity Value, Enterprise Value, and Multiples in M&A Deals

Questions about Equity Value and Enterprise Value in M&A deals are less common than ones on accretion/dilution, but they're still important because they often act as "add-on" questions.

So if you get the accretion/dilution question correct, the interviewer might follow up and ask you to describe what happens to Equity Value, Enterprise Value, and the key multiples.

1. An Acquirer with an Equity Value of $500 million and Enterprise Value of $600 million buys another company for a Purchase Equity Value of $100 million and Purchase Enterprise Value of $150 million.

What are the Combined Equity Value and Enterprise Value?

The Combined Enterprise Value equals the Enterprise Value of the Buyer plus the Purchase Enterprise Value of the Seller, so it's $600 million + $150 million = $750 million.

You can't determine the Combined Equity Value because it depends on the purchase method: Combined Equity Value = Acquirer's Equity Value + Value of Stock Issued in Deal.

If it's a 100% Stock deal, the Combined Equity Value will be $500 million + $100 million = $600 million, but if it's 100% Cash or Debt, the Combined Equity Value = $500 million.

And if the % Stock Used is above 0% but less than 100%, the Combined Equity Value will be between $500 and $600 million.

2. How do the Combined Equity Value and Enterprise Value relate to the purchase method?

The Combined Enterprise Value is not affected by the purchase method: Regardless of the % Cash, Debt, and Stock used, it's always equal to the Buyer's Enterprise Value plus the Purchase Enterprise Value of the Seller.

The Combined Equity Value is equal to the Buyer's Equity Value plus the Value of Stock Issued in the Deal, which could range from $0 up to the Purchase Equity Value of Seller.

So if it's a 100% Stock deal, the Combined Equity Value = Buyer's Equity Value + Purchase Equity Value of Seller.

3. So you're saying that in a 100% Cash or Debt deal, the Seller's Equity Value just "disappears"? How is that possible?

The Seller's Equity Value doesn't "disappear" – it's just *transformed* into the Cash or Debt used by the Acquirer in the deal.

The Combined Enterprise Value calculation demonstrates this point: *Both* companies' Enterprise Values still exist after the deal, so no value is "lost" along the way.

4. Let's say this same Acquirer (Equity Value of $500 million and Enterprise Value of $600 million) has Net Income of $50 million and EBITDA of $100 million.

The Target (Purchase Equity Value of $100 million and Purchase Enterprise Value of $150 million) has Net Income of $10 million and EBITDA of $15 million.

What are the Combined P / E and EV / EBITDA multiples in a 100% Stock deal? Assume the same tax rates for the Acquirer and Target.

The Combined Equity Value in a 100% Stock deal is $500 million + $100 million = $600 million, and the Combined Enterprise Value is $600 million + $150 million = $750 million.

The Combined EBITDA is $115 million, and the Combined Net Income, assuming the same tax rates, is $50 million + $10 million = $60 million.

Therefore, the Combined P / E multiple is $600 million / $60 million = 10x, and the Combined EV / EBITDA multiple is $750 million / $115 million = ~6.5x.

5. How would those Combined Multiples change in a 100% Cash or Debt deal?

The Combined EV / EBITDA multiple would stay the same because neither the Combined Enterprise Value nor the Combined EBITDA is affected by the purchase method.

The Combined P / E multiple would change because the Combined Equity Value would be lower, at $500 million, in a 100% Cash or Debt deal.

The Combined Net Income would also change because of the Foregone Interest on Cash and Interest on Debt.

In *most* cases, the Combined P / E multiple will be lower in a 100% Cash deal because the Combined Equity Value will decline by a greater percentage than the Combined Net Income.

It will also tend to be lower in a 100% Debt deal, but you'd have to run the numbers to see for sure – if the Interest Rate on Debt is relatively high and the Seller's P / E multiple is low, the Combined P / E multiple might increase.

6. How do the Combined Multiples change based on the purchase method?

Enterprise Value-based multiples do not change based on the % Cash, Debt, and Stock used because the Combined Enterprise Value is not affected by the purchase method, and EV-based metrics such as Revenue, EBITDA, and EBIT are also not affected by it.

Equity Value-based multiples *will* change based on the purchase method because the Combined Equity Value depends on the % Stock Used, and Equity Value-based metrics such as Net Income and Free Cash Flow are impacted by the Foregone Interest and Interest on New Debt.

7. What are the possible ranges for the Combined Multiples after a deal takes place?

The Combined Multiples should always be between the Buyer's multiples and the Seller's purchase multiples.

However, you can't just average the multiples to determine the Combined Multiples because the companies could be different sizes.

And it's **not** as simple as using the weighted average because the *proportion* of Enterprise Value and EBITDA from each company might be different.

The Combined Multiples will be closer to the Buyer's multiples if the Buyer is much bigger, but they'll be in the middle of the range if the Buyer and Seller are closer in size.

8. Consider this M&A scenario:

- **Company A: Enterprise Value of $100, Equity Value of $80, EBITDA of $10, Net Income of $4, and Tax Rate of 50%.**
- **Company B: Enterprise Value of $40, Equity Value of $40, EBITDA of $8, Net Income of $2, and Tax Rate of 50%.**

Calculate the EV / EBITDA and P / E multiples for each company.

Company A EV / EBITDA = $100 / $10 = 10x; P / E = $80 / $4 = 20x.

Company B EV / EBITDA = $40 / $8 = 5x; P / E = $40 / $2 = 20x.

9. Company A acquires Company B using 100% Cash and pays no premium to do so. Assume a 5% Foregone Interest Rate on Cash.

What are the Combined EBITDA and P / E multiples?

Combined EV / EBITDA = Combined Enterprise Value / Combined EBITDA = $140 / $18 = ~7.8x.

Combined P / E = Combined Equity Value / Combined Net Income.

The Combined Equity Value is just the Acquirer's Equity Value of $80 since no Stock was used.

We can add together both companies' Net Incomes since they have the same tax rate, so the Combined Net Income is $6. But we have to adjust for the Foregone Interest on Cash as well.

The Acquirer used $40 in Cash, and 5% * $40 = $2. After the 50% tax rate, that's a $1 loss.

So the Combined Net Income is $5, which makes the Combined P / E = $80 / $5 = 16x.

10. Now let's say that Company A instead uses 100% Debt with a 10% interest rate to acquire Company B.

Again, Company A pays no premium for Company B. What are the combined multiples?

The Combined EV / EBITDA multiple remains the same at ~7.8x because it is not affected by the purchase method.

The Combined Equity Value is still just the Acquirer's Equity Value of $80.

The Combined Net Income before adjustments is $6, but now we must adjust for the Interest on Debt.

If Company A uses $40 of Debt to acquire Company B, it will pay $40 * 10% * (1 – 50%), or $2, in After-Tax Interest.

So the Combined Net Income is $4, which makes the Combined P / E = $80 / $4 = 20x.

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Full Merger Model Mechanics

Ironically, questions on a "full merger model" tend to be easier than the questions above on accretion/dilution and multiple calculations.

That's because the **process** of building a complete merger model is straightforward, and the numbers get so complicated that you can't do mental math anymore.

So as with the first section of this guide, these questions tend to be more **conceptual**.

1. Why is the Purchase Price in an M&A deal NOT equal to the Seller's Purchase Equity Value or Purchase Enterprise Value exactly?

The real price depends on the treatment of the Seller's Cash and Debt in the deal.

If the Buyer repays the Seller's entire Debt balance with transaction funding and uses the Seller's entire Cash balance to fund the deal, the real price will be close to the Purchase Enterprise Value, but that hardly ever happens.

In most cases, the Buyer will "replace" the Seller's existing Debt with new Debt, which doesn't affect the cash price. And the Buyer hardly ever uses the Seller's entire Cash balance to fund the deal – at most, it might use a portion of it.

So the real price the Buyer pays is usually between the Purchase Equity Value and Purchase Enterprise Value of the Seller.

Many other issues, such as the transaction fees and the treatment of Preferred Stock, Capital Leases, and Unfunded Pensions, also explain this difference.

2. What information do you need from the Buyer and Seller to create a full merger model?

At the minimum, you need Income Statement projections for both companies over the next 1-2 years. But ideally, you will also create cash-flow projections that show how both companies' Cash and Debt balances change over time.

You do **not** need full 3-statement projections for both companies – similar to a DCF analysis, cash flow estimates without full Balance Sheet projections are fine.

3. Why is a Sources & Uses schedule important in a full merger model?

The Sources & Uses schedule is important because it tells you **how much the Buyer *really* pays for the Seller**.

The Purchase Equity Value and Purchase Enterprise Value can be deceptive for the reasons outlined above.

But with the S&U schedule, you add up the total cost of acquiring the company – its shares, any refinanced Debt, and any transaction fees – and then show the amount of Cash, Debt, and Stock that will be used to pay for it.

The S&U schedule is also helpful for reflecting more unusual scenarios, such as a Seller using some of its Cash in the deal or a Buyer repaying its own Debt.

4. What's the purpose of a Purchase Price Allocation schedule in a merger model?

The main purpose is to estimate the **Goodwill** that will be created in a deal.

Goodwill exists because Buyers often pay far more for companies than their Balance Sheets suggest they are worth; in other words, the Purchase Equity Value exceeds the acquired company's Common Shareholders' Equity (CSE).

When this happens, the Combined Balance Sheet will go out of balance because the Seller's CSE is written down, but the total amount of Cash, Debt, and Stock used in the deal exceeds the CSE that was written down.

So you estimate the new Goodwill with this schedule, factor in write-ups of Assets such as PP&E and Intangibles, and also include other acquisition effects such as the creation of Deferred Tax Liabilities and changes to existing Deferred Tax items.

5. Why do Deferred Tax Liabilities get created in many M&A deals?

A Deferred Tax Liability, or DTL, represents the *expectation* that cash taxes will exceed book taxes in the future.

It gets created because Depreciation & Amortization on Asset Write-Ups is not deductible for cash-tax purposes in a Stock Purchase (i.e., an M&A deal structured such that the Buyer purchases all the Seller's shares and acquires *everything* it has).

As a result, the Buyer will pay more in cash taxes than book taxes until the Write-Ups are fully depreciated. Each time the Buyer pays more in cash taxes than book taxes, the DTL decreases until it eventually reaches 0.

6. An Acquirer purchases a company for a $1 billion Equity Purchase Price, and this Target has $600 million in Common Shareholders' Equity and no Goodwill.

The Acquirer plans to write up the Target's PP&E and Other Intangible Assets by $100.

Walk me through the Purchase Price Allocation process, assuming a 40% tax rate.

The "Allocable Purchase Premium" equals the Equity Purchase Price minus the Common Shareholders' Equity, so $1 billion – $600 million = $400 million.

The PP&E and Other Intangible Assets increase by $100 million, so you *subtract* this figure because it means you won't need as much Goodwill. So the Purchase Premium is down to $300 million.

Then, you must create a Deferred Tax Liability that corresponds to these write-ups. It's equal to $100 million * 40%, or $40 million, and you *add it* because an increase in the Liabilities side means that more Goodwill will be needed.

So $340 million of Goodwill gets created, along with Asset write-ups of $100 million and a new Deferred Tax Liability of $40 million.

7. What happens if the Acquirer purchases another company for a $1 billion Equity Purchase Price, but the Target's Common Shareholders' Equity is $1.5 billion?

Assume there are no write-ups or other adjustments.

"Negative Goodwill" cannot exist per the rules of IFRS and U.S. GAAP.

So in this situation, you record this $500 million difference as a Gain on the Income Statement.

The Balance Sheet combination still works the same way, but you don't record any Goodwill; you just add all the acquired Assets and Liabilities.

The Balance Sheet still balances because Net Income increases as a result of this Gain. But this Gain is non-cash, so the company's Cash balance declines and Shareholders' Equity on the L&E side increases.

8. I don't believe you. Walk me through what happens if an Acquirer purchases a Target for an Equity Purchase Price $80, in 100% Cash, and the Target has $200 in Assets, $100 in Liabilities, and $100 in Common Shareholders' Equity.

You write down the Seller's CSE completely, add the $200 in Assets and $100 in Liabilities to the Acquirer's Balance Sheet, and then reduce the Cash balance by $80.

So far, the Assets side is up by $120 but the Liabilities side is up by only $100, so the Balance Sheet is out of balance.

But then you record a Gain of $20 on the Income Statement to reflect this "bargain purchase," which boosts Pre-Tax Income by $20 and Net Income by $12 at a 40% tax rate.

On the CFS, Net Income is up by $12, but you subtract the $20 Gain because it was non-cash, so Cash at the bottom is down by $8 (the intuition is that the company pays taxes on something it didn't receive in cash).

On the BS, Cash is down by $8 on the Assets side, so the Assets side is now up by $112, and on the L&E side, Shareholders' Equity is up by $12 because of the increased Net Income, so both sides are now up by $112 and balance.

9. What are the main adjustments you make when combining the Balance Sheets in an M&A deal?

You reflect the Cash, Debt, and Stock used in the deal, create new Goodwill, write up Assets such as PP&E and Other Intangibles, and reflect refinanced Debt. You also show new Deferred Tax Liabilities and the write-offs of existing DTLs and DTAs.

You must also write down the Seller's Common Shareholders' Equity and reflect transaction and financing fees (transaction fees affect Equity and financing fees are deducted from the new Debt balance).

There are many other adjustments; for example, you might reduce Accounts Receivable or Accounts Payable to reflect intercompany receivables or payables, and you might write down the Deferred Revenue balance after the transaction closes because accounting rules state that companies can recognize only the *profit portion* of Deferred Revenue after a deal.

10. Give me an example of how you might estimate revenue and expense synergies in an M&A deal.

With revenue synergies, you might assume that the Seller can sell its products to some of the Buyer's customer base. So if the Buyer has 100,000 customers, 1,000 of them might buy widgets from the Seller. Each widget costs $10.00, so that is $10,000 in extra revenue.

There will also be COGS and possibly Operating Expenses associated with these extra sales, so you must factor those in as well. For example, if the cost of each widget is $5.00, then the Combined Company will earn only $5,000 in extra Pre-Tax Income.

With expense synergies, you might assume that the Combined Company can close a certain number of offices or lay off redundant employees, particularly in functions such as IT, accounting, and administrative support.

So if both companies, combined, have 10 offices, and management feels that only 8 offices will be needed after the merger, the combined rental expense will decline.

If each office costs $100,000 per year to rent, there will be 2 * $100,000 = $200,000 in expense synergies, which will boost the Combined Pre-Tax Income by $200,000.

11. Why do many merger models tend to overstate the impact of synergies?

First, many merger models do **not** include the costs associated with revenue synergies. Even if the Buyer or Seller can sell more products or services after the deal takes place, those extra sales **cost something**. So you must also include the extra COGS and OpEx.

Second, realizing synergies **takes time**. Even if a company expects $10 million in "long-term synergies," it won't realize all of them in Year 1; it might take years, and the percentage realized will increase gradually each year.

Finally, realizing synergies **costs money**. There will always be "integration costs" associated with a deal, and certain types of synergies, such as building consolidation and headcount reduction, will cost even more due to severance costs.

12. Why do many merger models misstate the Foregone Interest on Cash and Interest on Debt?

Many merger models do **not** track the Combined Company's Cash and Debt balances over time.

If the model shows only 1-2 years, the numbers won't necessarily be too far off, but if you're building 5-year projections, you should project the combined cash flows as well.

If you don't track the changing Cash and Debt balances, Interest Income will be understated since the Cash balance tends to grow over time, while the Foregone Interest on Debt will be overstated since the Combined Company can repay Debt with its cash flow.

13. How do you calculate the Combined Company's Debt repayment capacity in a merger model?

You do this by creating a "mini" Cash Flow Statement for the combined company.

You eliminate most of the Financing and Investing sections (except for CapEx and sometimes Dividends), but you keep much, but not all, of the CFO section.

It's similar to what you do in a DCF to project Unlevered Free Cash Flow, but you're estimating the company's *Free Cash Flow* – **which includes Net Interest Expense** – here.

You have to include the Net Interest Expense because it directly impacts a company's ability to repay Debt and to generate Cash; the purpose is different from that of a DCF since you're not valuing a company but instead tracking its Cash and Debt balances.

14. How should you treat Stock-Based Compensation in a merger model?

The easiest approach is to ignore it and count it as a real cash expense. Just as in a DCF, SBC is problematic because it increases the company's share count and, therefore, reduces its value to

existing investors, but it's difficult to estimate the precise impact since you have to project the company's share price to do that.

So it's better NOT to add it back as a non-cash expense on the Combined CFS and to keep the Buyer's share count the same in all years.

That way, you still reflect how SBC reduces a company's value to existing investors and makes the deal more dilutive, but you don't have to estimate the number of shares it creates.

15. Why might you calculate metrics such as Debt / EBITDA and EBITDA / Interest for the Combined Company in an M&A deal?

These metrics tell you whether the Combined Company could afford to use more Debt to fund a deal or if it's using *too much* Debt to fund a deal.

Sometimes it's deceptive to look at a number like Debt / EBITA immediately *after* a deal closes because the Combined Company can de-lever rapidly by paying off Debt.

So even if its Debt / EBITDA temporarily jumps up to a high level, such as 5x or 6x, if it can repay Debt quickly and bring it down to 2x or 3x in 1-2 years, it might be able to use more Debt to fund the initial deal.

16. How do Pro-Forma EPS and Pro-Forma accretion/dilution from the standard, or IFRS/GAAP-compliant, figures?

This one gets *very* confusing because there's no "standard" definition for Pro-Forma EPS. But most people calculate it by adding back non-cash expenses created in an M&A deal, primarily the Amortization of Intangibles and the Depreciation of PP&E Write-Ups, and calculating Combined Net Income based on this "Pro-Forma" Pre-Tax Income.

Some people also add back Stock-Based Compensation and other non-cash charges, effectively making Pro-Forma EPS into "Cash EPS."

Many companies report Pro-Forma EPS and calculate accretion/dilution based on these figures, but you should be skeptical because these numbers understate the true costs of acquisitions where Buyers pay high premiums.

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More Advanced Features of Merger Models

This entire set of questions is **OPTIONAL**.

Interviews have shifted away from these topics and toward trickier questions on the fundamentals.

So these more advanced features are good to know if you've had full-time work experience in finance and worked on M&A deals before, but they're **not important** if you're interviewing for entry-level roles.

1. Why do Buyers tend to prefer Asset Purchases and Sellers tend to prefer Stock Purchases?

In Asset Purchases, Buyers can pick and choose exactly which Assets they want to acquire and which Liabilities they want to assume, which reduces transaction risk.

Also, Buyers can deduct D&A on Asset write-ups for cash-tax purposes in an Asset Purchase, which reduces their tax burden after the deal closes.

Sellers tend to prefer Stock Purchases because Asset Purchases leave them with more risk after deals close and because they must pay taxes on the entire purchase price PLUS the Gains recorded on Assets in an Asset Purchase.

2. What's the advantage of a 338(h)(10) Election for a U.S.-based Buyer?

In a 338(h)(10) Election, the Buyer and Seller choose to treat a Stock Purchase as if it were an Asset Purchase for tax purposes.

So the Buyer still acquires all the Assets, Liabilities, and off-Balance Sheet items of the Seller, but it can also deduct D&A on Asset Write-Ups for cash-tax purposes.

338(h)(10) deals can help Buyers and Sellers compromise and reach an agreement more quickly since they combine elements favored by Buyers and Sellers in Asset and Stock Purchases.

3. If a Seller has a massive NOL balance, should the Buyer use a Stock Purchase, Asset Purchase, or 338(h)(10) Election to acquire it?

The Buyer should use a Stock Purchase because NOLs are written down in Asset Purchases and 338(h)(10) deals, and the Buyer cannot use any of the Seller's NOLs in those.

4. Walk me through what happens in a Stock Purchase deal where the Buyer pays an Equity Purchase Price of $2 billion for the Seller, and the Seller has an off-Balance Sheet NOL balance of $500 million. The NOLs expire in 5 years.

Assume that the Long-Term Adjusted Rates for the past 3 months were 2%, 3%, and 4%, and that the Buyer's Tax Rate is 40%.

If the off-BS NOL balance is $500 million, the portion within the DTA should be approximately $200 million at a 40% tax rate.

The Buyer is allowed to use 4% * $2 billion, or $80 million, per year.

The NOLs expire in 5 years, which means the Buyer can use only 5 * $80 million = $400 million total.

Therefore, the Buyer will write down $100 million of the off-BS NOLs and $40 million of the NOLs represented within the DTA when the transaction first occurs.

After that, the Buyer will use $80 million of the NOLs each year to reduce its cash-taxable income, so the off-BS balance will decline by $80 million per year, and the portion within the DTA will decline by $32 million per year until they both reach $0 in Year 5.

5. How do these numbers change in an Asset Purchase?

In an Asset Purchase, the Net Operating Losses – both the off-Balance Sheet and on-Balance Sheet versions – are written down to $0, and the Buyer can't use any of the Seller's NOLs.

6. Why would a Buyer and Seller agree to an Earn-Out in an M&A deal?

They might agree to an Earn-Out if they disagree about the Seller's future financial performance and, therefore, can't agree on a price.

For example, the Buyer might think the Seller will grow at only 5% per year, but the Seller believes it will grow at 15% per year.

As a compromise, the Buyer might offer the Seller upfront cash, along with additional compensation if it achieves financial goals, such as reaching $100 million in revenue or $20 million in EBITDA in 2 years (for example).

7. A Buyer acquires a Seller for an Equity Purchase Price of $1 billion. It also promises $200 million in 2 years if the Seller earns $100 million in EBITDA by then.

The Seller's Common Shareholders' Equity is $600 million, and the Buyer plans to write up Assets for $100 million total. Assume a 40% tax rate and a Stock Purchase structure, and walk me through the Purchase Price Allocation in this deal.

First, you subtract the Seller's CSE from the Equity Purchase Price, which results in an Allocable Purchase Premium of $400 million.

The Buyer writes up Assets for $100 million, which reduces that Premium because less Goodwill is needed. So it's down to $300 million.

A Deferred Tax Liability will also be created because of these write-ups, which we can estimate at $100 million * 40% = $40 million. This DTL will increase the Premium because more Goodwill must balance this DTL on the other side. So we're up to $340 million.

Next, we have to record the $200 million Earn-Out as "Contingent Consideration" on the L&E side, and this will also boost the Premium because it means more Goodwill will be required.

So we end up with a total of $540 million in Goodwill from this deal.

8. In Year 1, the Buyer believes the Seller is far less likely to earn $100 million in EBITDA, so it reduces the value of the Contingent Consideration Liability by 30%.

Walk me through the 3 statements.

$200 million * 30% = $60 million, so the Contingent Consideration will decline by $60 million. However, this change will be recorded as a **POSITIVE** on the Income Statement because it's a write-down of a Liability.

So Pre-Tax Income on the Income Statement will be up by $60 million, and Net Income will be up by $36 million at a 40% tax rate.

On the CFS, its Net Income is up by $36 million, but this Change in Contingent Consideration was non-cash, so you subtract $60 million, and Cash is down by $24 million at the bottom.

On the BS, Cash is down by $24 million, so the Assets side is down by $24 million, and on the other side, the Contingent Consideration is down by $60 million but Retained Earnings is up by

$36 million because of the increased Net Income, so the L&E side is also down by $24 million, and both sides balance.

9. In Year 2, the Buyer realizes it was wrong and reverses this change. Then, at the end of Year 2, the Seller achieves its goals and reaches $100 million in EBITDA.

Walk me through the financial statements when the Earn-Out is paid out to the Seller.

When the Earn-Out is paid to the Seller, there are no changes to the Income Statement. The $200 million cash outflow is recorded within Cash Flow from Financing on the CFS.

On the Balance Sheet, Cash is down by $200 million, so the Assets side is down by $200 million, and the Contingent Consideration also declines by $200 million, so the L&E side is also down by $200 million, and the Balance Sheet balances.

10. What's the difference between Fixed and Floating Exchange Ratios, and which one do Buyers prefer?

With a Fixed Exchange Ratio, the Seller receives a constant number of shares. For example, the Buyer might agree to issue 2 new shares for each of the Seller's shares. The Seller's ownership will stay the same, but its purchase price will change based on the Buyer's share price.

With a Floating Exchange Ratio, the Seller receives a fixed purchase price, but a variable number of shares. For example, the Buyer might agree to pay $200 million to the Seller, but that means 10 million shares if the Buyer's share price is $20.00 and 40 million shares if the Buyer's share price is $5.00.

Buyers care the most about **avoiding dilution** in M&A deals, so a Buyer tends to favor the Fixed Exchange Ratio if it's not confident of its future share price movement. But if the Buyer is reasonably confident that its share price will rise, it might favor a Floating Exchange Ratio so that it issues fewer shares.

11. Why might a Buyer and Seller agree to a collar in a 100% Stock deal?

100% Stock deals present risk for both Buyers and Sellers: The Buyer could end up diluting itself by a huge amount if its share price falls, while the Seller could end up receiving fewer shares than it expects if the Buyer's share price rises.

A **collar** is a way to compromise and reduce risk on both sides by establishing a Fixed Exchange Ratio within a certain range of Buyer share price, with Floating Exchange Ratios outside that region. You could also set it up the opposite way.

Sellers can be assured of receiving a fixed purchase price or a fixed number of shares, within a reasonable range of share prices for the Buyer, while Buyers can limit their dilution.

12. What are example terms you might see for a Fixed Exchange Ratio Collar in an M&A deal?

With a Fixed Exchange Ratio Collar, the Seller gets a fixed number of shares within a certain share price range for the Buyer, so the purchase price will vary within that range.

Above or below that range, the purchase price is fixed but the number of shares the Seller receives varies.

For example:

- **Buyer's Share Price Between $50.00 and $60.00:** The Seller always gets 10 million of the Buyer's shares.
- **Buyer's Share Price Above $60.00:** The Seller gets a maximum price of $600 million, and the shares issued vary based on the Buyer's share price.
- **Buyer's Share Price Below $50.00:** The Seller gets a minimum price of $500 million, and the shares issued vary based on the Buyer's share price.

13. Walk me through what happens on the financial statements immediately after a Buyer acquires a 20% stake in a Seller worth $500 million using 50% Cash and 50% Debt.

Since this is a minority stake, Equity Investment accounting applies. There will be no Purchase Price Allocation or financial statement consolidation.

Instead, the Buyer will create an "Equity Investment" line item for 20% * $500 million = $100 million on the Assets side.

Its Cash balance will decrease by $50 million, so the Assets side is up by $50 million, and its Debt balance on the L&E side will increase by $50 million, so both sides are up by $50 million and balance.

14. Walk me through the same scenario, but assume that the Buyer acquires a 70% stake in the Seller instead.

In this case, you apply purchase accounting and must consolidate the financial statements and create Goodwill because the Buyer acquires more than 50% of the Seller.

You start by creating Goodwill based on the Seller's Equity Purchase Price of $500 million minus its Common Shareholders' Equity and any Asset write-ups (and other adjustments).

Then, you add together the Buyer and Seller's Balance Sheets and other financial statements 100%, but you write down the Seller's Common Shareholders' Equity.

Then, you record a Noncontrolling Interest for the portion of the Seller that the Buyer does *not* own, which is 30% * $500 million = $150 million here.

Since it's a 50 / 50 Cash / Debt deal, the Cash balance on the Assets side declines by $75 million and the Debt on the L&E side increases by $75 million.

The Balance Sheet *appears* to be out of balance, but that's because we haven't yet factored in Goodwill since we didn't have enough information to calculate it. Once we do that, the Assets side will equal the L&E side.

15. What would change in a merger model if the deal closed on an irregular date, such as August 15th?

You would have to "roll forward" the most recent Balance Sheets for both companies to August 15th and combine them on that date, ensuring that the Purchase Price Allocation and Sources & Uses schedules are also based on that date.

You would also create a "stub period" for the combined Income Statement and Cash Flow Statement and show what happens between August 15th and the end of the companies' first quarter (or first year) as a combined company.

Even when this type of stub period exists, you tend to focus on the **first full-year results** in a merger model – EPS accretion/dilution means more over an entire year than it does over a stub period or a quarter.

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