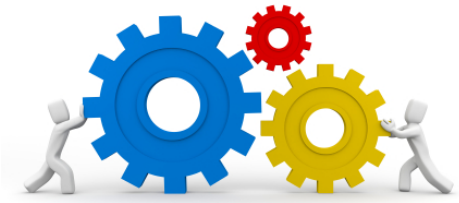
Table of Contents – Merger Model Questions & Answers

Overview and Key Rules of Thumb



The **merger model** (also known as an accretion / dilution model or M&A model, among others) is another topic that's almost 100% guaranteed to come up in interviews.

The merger model is very common in investment banking since bankers spend so much time advising clients on M&A activity, but it also pops up even in roles like equity research and private equity, because the companies you follow could always acquire other companies, or be acquired – and you need to understand how to analyze those scenarios.

The great part about a merger model is that the analysis itself is not terribly complex – if you already know accounting, you could learn the fundamentals in about an hour. But at the same time, it's also very insightful and tells you a lot about the deal in question.

But many interviewees only memorize selected facts about M&A and merger models rather than aiming to understand the **full picture** – which causes problems in interviews, since interviewers could always come up with new variations on standard questions.

Here are the 5 most important concepts you need to understand:

1. **Why** would you buy (or merge with) another company? Merger models are pointless if you don't understand this.
2. How does a merger model **work**? How do you set it up, make assumptions, combine two companies' financial statements, and analyze the result at the end?
3. How do you **finance** the purchase? There are 3 main methods, and they all have different trade-offs and effects on the model.
4. What happens **immediately** after you buy the other company?

5. What happens in the **long-term**, and what causes mergers and acquisitions to be successful or unsuccessful?

Once again, the Excel model that we provide will be huge for understanding these questions because you'll see the effects of everything firsthand.

The interactive quiz will also be helpful, but we focus more on **concepts** there rather than specific numbers – since conceptual questions are more likely in interviews.

We'll start by going through each of these key rules below, and then delve into the Basic and Advanced questions and answers.

Key Rule #1: Why Buy Another Company?

Everything in finance (and arguably life itself) comes down to the **return on investment**.

A company would buy another company if it believes that it will *earn* more from the acquisition than it spends to complete the acquisition.

For example, maybe the buyer is considering acquiring the seller for $500 million. The buyer has run the numbers, analyzed the seller's business and its own business, and concluded that it might earn between $1 billion and $1.2 billion over the next 10 years by acquiring the seller.

If you do the math in Excel, you'll see that this is roughly a **15% Internal Rate of Return (IRR)** if you assume $100 million in "additional earnings" each year afterwards – a good result for most deals.

If the buyer only projected, say, a 5% return from the acquisition, it would be far less likely to do the deal.

This explains the **buyer's rationale** for pursuing or not pursuing an acquisition – but investors and analysts tend to focus on **Earnings Per Share (EPS)** and how that changes as a result of the acquisition in the near-term (the next 1-2 years).

Combined Income Statement:		
	Combined Years	
	Year 1	Year 2
Net Income:	**6,545**	**7,328**
Diluted Shares Outstanding:	903.0	896.0
Shares Issued in Transaction:	52.6	52.6
Total New Shares Outstanding:	955.7	948.6
EPS:	$ 6.85	$ 7.73
Buyer Standalone EPS:	$ 6.72	$ 7.49
Accretion / (Dilution):	**$ 0.13**	**$ 0.23**
Accretion / (Dilution) %:	**1.9%**	**3.1%**

EPS is simply Net Income / Shares Outstanding, and depending on the price the buyer pays, the seller's pre-tax profits, and the purchase method, it may go up, go down, or be about the same afterward.

In a merger model, you usually focus on **EPS accretion / dilution** (accretion = the buyer's EPS goes up, dilution = the buyer's EPS goes down) and figure out whether the deal will increase or decrease EPS, or have no impact.

Before you start thinking about that, though, you need to understand more about *why* a buyer might want to acquire a seller. In other words, what could **cause** the buyer to earn a good return on investment, or (perhaps) boost its Earnings Per Share?

We can divide the rationale for buying a company into "financial reasons" and "fuzzy reasons."

Financial Reasons for Acquisitions

In mature markets, **consolidation** often motivates M&A activity. For example, there might be 4 major players in the market and the 3rd largest company wants to acquire the 4th largest company to take on the #1 and #2 companies more effectively.

With these types of deals, it's usually obvious that the acquisition will yield a good return on investment or otherwise boost EPS because both businesses are mature and predictable.

Sometimes **geography** plays a role in deals as well – the buyer is based in North America, but the seller's customer base is in Europe and so they could expand by growing geographically.

Besides gaining market share, a buyer might also be motivated to acquire a seller because it needs to grow more quickly and sees a faster-growing, smaller company as a solid way to achieve that goal. All else being equal, investors value higher-growth companies more highly.

Sometimes the company in question might be **undervalued** – or at least be viewed as undervalued – in which case the buyer might also be interested.

At the right price almost any deal would yield a good return, so a specific company's valuation can motivate M&A activity as well.

The buyer might also be motivated to gain the seller's **customers** – maybe it estimates that it could up-sell higher-priced products or services to 20% of the seller's customers, or cross-sell some of its own products, which results in significantly more revenue and profit for them.

There's a lot of guesswork involved with this type of reasoning, which takes us into our next category for acquisitions: fuzzy reasons.

Fuzzy Reasons for Acquisitions

Bankers would like to claim otherwise, but plenty of acquisitions happen for **completely irrational reasons**.

In fact, **massive** acquisitions (anything worth over $50 billion USD) are often driven almost entirely by ego, politicking, and sometimes a sense of "destiny" (Of course we should buy them! It's our destiny to be the biggest company ever!).

The cross-selling and up-selling motivation above usually qualifies for this category, because there's no way to know in advance what the uptake will be or how much these efforts will add to the bottom-line.

Other reasons include:

- The seller has a particularly important technology, patent, or other **intellectual property** that the buyer views as essential.
- The seller poses a **threat**, whether real or imagined, to the buyer's business and the buyer wants to make a defensive acquisition.
- The seller has amazing **employees** and the buyer is willing to pay a premium just to get these employees (an "acqui-hire," common with tech start-ups).
- Although the seller is not projected to yield a good ROI or boost EPS in the near-term, the buyer thinks that there are intangible benefits that will materialize in the **very long-term**.

These reasons are much more common in research & development-driven industries such as technology and biotech, and much less common in old-school, asset-based industries like manufacturing.

Here's the key takeaway: a buyer will **only** acquire a seller if it believes that it will gain **something** from the deal – it will earn *more* from the acquisition than what it's spending on the acquisition.

Mergers vs. Acquisitions

The only difference between a "merger" and an "acquisition" is that in a merger, the buyer and seller are about the same size, whereas in an acquisition the buyer is significantly bigger (usually at least 2-3x bigger by revenue or market cap).

Mechanically, they work exactly the same way and there is no difference in a merger model regardless of whether the deal is classified as a merger or an acquisition.

There are certain transaction *structures* and *purchase methods* that may differ depending on whether it's a merger or acquisition, which we'll get into in the questions and answers below, but the mechanics are the same.

There are also differences between acquiring over 50% of a company and less than 50% of a company, but we'll address that in the Advanced Questions and Answers below.

Key Rule #2: How Does a Merger Model Work?

You can divide a merger model into an **8-step process** – we'll briefly go through the steps here, and then look at a few of the steps in more detail below.

Step 1: Determine the Purchase Price

You do this the same way you value any other company: you would use a combination of Public Comps, Precedent Transactions, and the DCF (and possibly other methodologies) to come up with a reasonable price.

If it's a public company you come up with a per-share purchase price; if it's a private company you might assume an Implied Equity Value based on the valuation. The example below is for a public company, where we've assumed a **premium** to the seller's share price:

Transaction Assumptions			
Buyer Name:	United Technologies Corp	Premium to Seller's Share Price:	47.4%
Seller Name:	Goodrich Corporation	Per Share Purchase Price:	$ 127.50
		Equity Purchase Price:	$ 15,921

Step 2: Determine the Purchase Method

Once you've determined the price for the seller, you need to figure out how to pay for it: **cash, stock, or debt**.

- **Cash:** Just like normal cash in your bank account. Cold, hard money that you can immediately withdraw and use to pay for something. The downside is that you give up **interest** that you could have earned on that cash, which is known as the **foregone interest on cash**.
- **Debt:** Similar to a mortgage, student loan debt, or auto debt in real life: you take out a loan and pay interest on that loan, also repaying the principal to the lenders over time.
- **Stock:** Sort of like "trading in" your existing car or house when you go to buy a new one. You're using the value of an existing asset – your company – to buy something else. The downside is that you'll get **additional shares outstanding**, which will reduce your Earnings Per Share and may upset investors.

% Cash:	0.0%	Cash Used:	$ -
% Stock:	25.0%	Stock Issued - Dollar Value:	3,980
% Debt:	75.0%	Debt Issued:	11,941

Some deals will involve just one of these, but many deals use 2 or 3 of these methods (e.g. 20% cash, 40% debt, 40% stock).

The method you use depends on how much cash you can afford to use, how much debt or stock you can afford to issue, the structure of recent deals in the market, and what the company's upcoming plans are (Expanding? Buying a new factor? Raising debt?).

You would determine the interest rates for cash and debt based on what's happening in the market and prevailing interest rates at the time of the deal.

Buyers *generally* prefer to pay with 100% cash, if possible – it's the cheapest option since the interest rate on cash is lower than the interest rate on debt. The "cost" of issuing equity depends on the P / E multiples of the buyer and seller (more on this below), but it is almost always more expensive than cash or debt.

Step 3: Project the Financial Profiles and Statements of the Buyer and Seller

This one comes straight from the 3-statement models that you've created for the buyer and seller. Here's what you need at the bare minimum:

- **Valuation** – Share Price, Shares Outstanding, and Equity Value and Enterprise Value.
- **Tax Rates** – You'll need the buyer's tax rate when combining the Income Statements in the next step.
- **Revenue** – Kind of a big deal on the Income Statement…
- **Operating Income** – You don't need *all* the items in between revenue and operating income on the Income Statement. If you have them, great, but revenue and operating income are the most important ones.
- **Interest Income / (Expense)** – You need these to calculate Pre-Tax Income.
- **Pre-Tax Income and Net Income** – Self-explanatory.
- **Shares Outstanding and EPS** – You need these to calculate EPS and **accretion / dilution** at the end.

Here's a simple example of Income Statement projections:

United Technologies Corp - Financial Profile Prior to Acquisition	
Share Price:	$ 75.61
Shares Outstanding (Millions):	908.7
Market Cap:	$ 68,708
Buyer Average Tax Rate:	30.7%

Goodrich Corporation - Financial Profile Prior to Acquisition	
Share Price:	$ 86.48
Shares Outstanding (Millions):	124.9
Market Cap:	$ 10,799
Seller Average Tax Rate:	30.0%

Buyer - Income Statement	Current	Projected Years	
	Year	Year 1	Year 2
Revenue:	$ 59,163	$ 63,107	$ 66,665
Costs and Expenses:	50,794	53,717	56,413
Operating Income:	8,369	9,390	10,252
Interest Expense & Other:	(592)	(596)	(592)
Pre-Tax Income:	7,777	8,794	9,660
Income Taxes:	(2,388)	(2,726)	(2,946)
Tax Rate:	30.7%	31.0%	30.5%
Net Income:	$ 5,389	$ 6,068	$ 6,714
Earnings Per Share (EPS):	$ 5.92	$ 6.72	$ 7.49
Average Shares Outstanding:	910.5	903.0	896.0

Seller - Income Statement	Historical	Projected Years	
	Year	Year 1	Year 2
Revenue:	$ 8,154	$ 9,134	$ 9,941
Costs and Expenses:	6,884	7,721	8,363
Operating Income:	1,269	1,413	1,578
Interest Expense & Other:	(153)	(145)	(149)
Pre-Tax Income:	1,117	1,268	1,430
Income Taxes:	(335)	(380)	(429)
Tax Rate:	30.0%	30.0%	30.0%
Net Income:	$ 782	$ 888	$ 1,001
Earnings Per Share (EPS):	$ 6.22	$ 7.09	$ 8.03
Average Shares Outstanding:	125.6	125.2	124.6

You don't truly "need" projections for the Balance Sheet and Cash Flow Statement, but you should at least have the Balance Sheets for the buyer and seller from just before the acquisition closes.

Step 4: Combine the Buyer and Sellers' Income Statements

Combined Income Statement:		
	Combined Years	
	Year 1	Year 2
Buyer + Seller Revenue:	$ 72,241	$ 76,606
Revenue Synergies:	685	746
Total Revenue:	**72,926**	**77,351**
Buyer + Seller Costs and Expenses:	61,438	64,776
Expenses Associated with Revenue Synergies:	548	596
Cost Synergies:	(232)	(251)
Total Costs and Expenses:	**61,754**	**65,121**
Total Operating Income:	**11,172**	**12,230**
Buyer + Seller Interest Income / (Expense):	(741)	(741)
Foregone Interest on Cash:	-	-
Interest Paid on New Debt:	(358)	(358)
New Amortization of Intangibles Expense:	(567)	(567)
New Depreciation Expense:	(20)	(20)
Pre-Tax Income:	**9.485**	**10.544**
Income Taxes:	(2,940)	(3,216)
Tax Rate:	31.0%	30.5%
Net Income:	**6,545**	**7,328**
Diluted Shares Outstanding:	903.0	896.0
Shares Issued in Transaction:	52.6	52.6
Total New Shares Outstanding:	955.7	948.6
EPS:	$ 6.85	$ 7.73
Buyer Standalone EPS:	$ 6.72	$ 7.49
Accretion / (Dilution):	**$ 0.13**	**$ 0.23**
Accretion / (Dilution) %:	**1.9%**	**3.1%**

This is straightforward: you just add together everything on the Income Statements down to the Pre-Tax Income line.

Then, you multiply the Combined Pre-Tax Income by (1 – Buyer's Tax Rate) to get to the Combined Net Income – this is a **very** important point because many people do this incorrectly and multiply by the Seller's Tax Rate or some type of "combined" Tax Rate, both of which are wrong.

Finally, you add new shares issued to the buyer's shares outstanding, and divide Net Income by that new share count to determine EPS.

Note that you do **not** add in the seller's shares outstanding – they are all wiped out in the acquisition, and go away completely.

Step 5: Calculate Goodwill and Allocate the Purchase Price

When a buyer acquires a seller, the seller's shares outstanding disappear completely and its Shareholders' Equity is also wiped out and goes to $0 – because it no longer exists as an independent entity.

However, that creates a problem when we combine the Balance Sheets of the buyer and seller – consider the following scenario:

- The buyer has $10,000 in Assets, $8,000 in Liabilities, and $2,000 in Shareholders' Equity.
- The seller has $1,000 in Assets, $800 in Liabilities, and $200 in Shareholders' Equity.
- The buyer pays $500 for the seller, using 100% cash.

We add the Liabilities, so the combined total is $8,800, and we wipe out the sellers' Shareholders' Equity so the total is still $2,000. Liabilities & Equity = $10,800.

Now, on the other side, we add Assets from both companies, which gets us to $11,000… except the buyer has used $500 in cash to purchase the seller, so its Assets side is only $10,500. The Balance Sheet is out of balance!

Combining the Balance Sheets:					
Buyer:		**Seller:**		**Combined:**	
Assets:	$ 10,000	Assets:	$ 1,000	Assets:	$ 10,500
Liabilities:	$ 8,000	Liabilities:	$ 800	Liabilities:	$ 8,800
Equity:	$ 2,000	Equity:	$ 200	Equity:	$ 2,000
Balanced?	**OK!**	**Balanced?**	**OK!**	**Balanced?**	**($300)**

When this happens, we need to create an Asset called **Goodwill** (and a related Asset called **Other Intangible Assets**) to account for the premium that a buyer has paid *above* the seller's Shareholders' Equity.

In this case, the purchase price is $500 but the seller's Shareholders' Equity is only $200 – so we would create $300 in Goodwill (and/or Other Intangible Assets) to account for that premium, and we'd add that new $300 Asset to the combined Balance Sheet on the Assets side.

Now the Balance Sheet would balance properly since the Assets side is $10,800, which matches the Liabilities & Equity side.

There are other effects in an acquisition as well – for example:

- We often adjust the value of the seller's **PP&E** and possibly other Assets.
- We usually "reset" the seller's existing **Goodwill** and write it down to $0.
- We create **Deferred Tax Liabilities** due to the adjustments to PP&E and other Assets, and we may write off the seller's existing Deferred Tax Liabilities.

Purchase Price Allocation & Pro-Forma Balance Sheet Adjustments				
Goodwill Calculation:		**Fixed Asset Write-Up:**		
Equity Purchase Price:	$ 15,921	PP&E Write-Up %:		10.0%
Less: Seller Book Value:	(3,739)	PP&E Write-Up Amount:		163
Plus: Write-Off of Existing Goodwill:	1,991	Depreciation Period (Years) - Book:		8
Total Allocable Purchase Premium:	**$ 14,173**	Yearly Depreciation Expense - Book:		20
Less: Write-Up of PP&E:	(163)	**Intangible Asset Write-Up:**		
Less: Write-Up of Intangibles:	(2,835)	Excess Purchase Price to Allocate:		14,173
Less: Write-Off of Existing DTL:	(584)	% Allocated to Intangibles:		20.0%
Plus: Write-Off of Existing DTA:	234	Intangibles Write-Up Amount:		2,835
Plus: New Deferred Tax Liability:	921	Amortization Period (Years) - Book:		5
Total Goodwill Created:	**$ 11,747**	Yearly Amortization Expense - Book:		567
		New Deferred Tax Liability:	$	921

And the list goes on – we cover this in more detail in the Advanced Questions and Answers section below.

Here's the key takeaway: **you adjust a bunch of items** on the Balance Sheet in a merger model, and you need to create Goodwill (and Other Intangible Assets) to plug the holes and represent the premium that a buyer pays over a seller's Shareholders' Equity.

The *difference* between Goodwill and Other Intangible Assets is that Goodwill is not amortized and therefore doesn't change unless there's an Impairment charge,

whereas Other Intangible Assets amortize over time, reflecting how they "expire."

Step 6: Combine the Balance Sheets and Adjust for Acquisition Effects

This is fairly straightforward because you are mostly just adding together all the relevant line items. Here's what you do in each section:

- **Current Assets:** You add most of these items, and subtract any Cash the buyer uses to acquire the seller.
- **Long-Term Assets:** You adjust the PP&E value up or down, and also adjust the values of Goodwill and Other Intangible Assets depending on the previous step.
- **Current Liabilities:** You add everything here, perhaps adding or subtracting Debt if the buyer uses Debt to acquire the seller or pays off the seller's Debt.

Combined Balance Sheet:					
	Pre-Transaction		Adjustments		
	Buyer	Seller	Debit	Credit	Close Date
Assets:					
Current Assets:					
Cash & Cash-Equivalents:	$ 2,707	$ 987	$ -	$ -	$ 3,694
Other Current Assets:	22,647	4,280	-	-	26,927
Total Current Assets:	**25,354**	**5,267**			**30,621**
Long-Term Assets:					
PP&E, Net:	6,371	1,633	163	-	8,168
Goodwill:	21,466	1,991	11,747	1,991	33,213
Other Intangible Assets:	-	917	2,835	-	3,752
Deferred Tax Assets:	-	234	-	234	-
Other Long-Term Assets:	6,922	671	-	-	7,593
Total Long-Term Assets:	**34,759**	**5,447**			**52,726**
Total Assets:	**60,113**	**10,714**			**83,347**
Liabilities & Equity:					
Current Liabilities:					
Short-Term Debt:	-	27	-	-	27
Other Current Liabilities:	18,662	2,026	-	-	20,688
Total Current Liabilities:	**18,662**	**2,052**			**20,714**
Long-Term Liabilities:					
Long-Term Debt:	10,010	2,374	-	11,941	24,325
Deferred Income Tax Liability:	-	584	584	921	921
Other Long-Term Liabilities:	8,879	1,965	-	-	10,844
Total Long-Term Liabilities:	**18,889**	**4,923**			**36,090**
Total Liabilities:	**37,551**	**6,975**			**56,804**
Equity:	**22,562**	**3,739**	**3,739**	**3,980**	**26,542**
Total Liabilities & Equity:	**$ 60,113**	**$ 10,714**			**$ 83,347**
Balance Check:	**OK!**	**OK!**			**OK!**

- **Long-Term Liabilities:** You add most items here, but you add or subtract Debt if the buyer uses Debt to acquire the seller or pays off the seller's Debt; you may also adjust the Deferred Tax Liability.
- **Shareholders' Equity:** You wipe out the seller's Shareholders' Equity, but add the **dollar value** of new shares issued by the buyer.

Step 7: Adjust the Combined Income Statement for Acquisition Effects

Here are the key items that you adjust for on the Income Statement:

- **Synergies:** If you've assumed revenue or expense **synergies**, you need to reflect them here.
- **Depreciation & Amortization:** If you've assumed changes to PP&E or you've created Other Intangible Assets, you need to reflect the new D&A expense on the combined Income Statement.
- **Foregone Interest on Cash:** If the buyer uses cash to acquire the seller, this equals Cash Used * Interest Rate.
- **Interest Paid on New Debt:** If the buyer uses debt to acquire the seller, this equals Debt Used * Interest Rate.

Combined Income Statement:		
	Combined Years	
	Year 1	Year 2
Buyer + Seller Revenue:	$ 72,241	$ 76,606
Revenue Synergies:	685	746
Total Revenue:	**72,926**	**77,351**
Buyer + Seller Costs and Expenses:	61,438	64,776
Expenses Associated with Revenue Synergies:	548	596
Cost Synergies:	(232)	(251)
Total Costs and Expenses:	**61,754**	**65,121**
Total Operating Income:	**11,172**	**12,230**
Buyer + Seller Interest Income / (Expense):	(741)	(741)
Foregone Interest on Cash:	-	-
Interest Paid on New Debt:	(358)	(358)
New Amortization of Intangibles Expense:	(567)	(567)
New Depreciation Expense:	(20)	(20)
Pre-Tax Income:	**9,485**	**10,544**
Income Taxes:	(2,940)	(3,216)
Tax Rate:	31.0%	30.5%
Net Income:	**6,545**	**7,328**
Diluted Shares Outstanding:	903.0	896.0
Shares Issued in Transaction:	52.6	52.6
Total New Shares Outstanding:	955.7	948.6
EPS:	$ 6.85	$ 7.73
Buyer Standalone EPS:	$ 6.72	$ 7.49
Accretion / (Dilution):	**$ 0.13**	**$ 0.23**
Accretion / (Dilution) %:	**1.9%**	**3.1%**

- **Shares Outstanding:** If the buyer issues shares to raise the funds to acquire the seller, the new number here equals Old Buyer Shares Outstanding + Number of Shares Issued in Deal.

See the diagram above for a visual example of what all these items would look like, and how they impact the EPS at the bottom.

Step 8: Calculate Accretion / Dilution and Create Sensitivity Tables

To calculate Accretion / Dilution, you compare the new, Combined Earnings Per Share (EPS) number to the buyer's old, projected EPS number from before the acquisition.

If the buyer was projected to have an EPS of $1.00 prior to the acquisition, but the combined company, post-acquisition, is projected to have $1.10 EPS, that's 10% **accretion**. If they only have $0.90 EPS post-acquisition, that's 10% **dilution**.

You don't stop with this number – normally you create **sensitivity tables** that allow you to analyze the change in EPS at different purchase prices, transaction structures, and purchase methods.

For example, you might see how the EPS changes when you buy a company with 30% cash, 40% cash, 50% cash, and 60% cash, at purchase prices ranging from $500 million to $600 million. There's an example below for the deal we've been referencing in this guide:

Sensitivity Analysis - GAAP / IFRS EPS Accretion/Dilution and Purchase Price vs. Cash/Stock Split:

Per Share Purchase Price	Purchase Consideration - % Stock								
	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%	45.0%
$ 137.50	4.5%	3.5%	2.5%	1.6%	**0.6%**	(0.3%)	(1.1%)	(2.0%)	(2.9%)
135.00	4.8%	3.8%	2.8%	1.9%	**1.0%**	0.1%	(0.8%)	(1.7%)	(2.5%)
132.50	5.0%	4.0%	3.1%	2.2%	**1.3%**	0.4%	(0.5%)	(1.3%)	(2.1%)
130.00	5.3%	4.3%	3.4%	2.5%	**1.6%**	0.7%	(0.1%)	(1.0%)	(1.8%)
127.50	**5.5%**	**4.6%**	**3.7%**	**2.8%**	**1.9%**	**1.1%**	**0.2%**	**(0.6%)**	**(1.4%)**
125.00	5.8%	4.9%	4.0%	3.1%	**2.2%**	1.4%	0.6%	(0.2%)	(1.0%)
122.50	6.1%	5.2%	4.3%	3.4%	**2.6%**	1.7%	0.9%	0.1%	(0.7%)
120.00	6.3%	5.4%	4.6%	3.7%	**2.9%**	2.1%	1.3%	0.5%	(0.3%)
117.50	6.6%	5.7%	4.9%	4.0%	**3.2%**	2.4%	1.6%	0.8%	0.1%
115.00	6.9%	6.0%	5.2%	4.3%	**3.5%**	2.7%	2.0%	1.2%	0.4%

This type of table lets you better assess whether or not the deal still "works" under different assumptions.

Key Rule #3: How Does the Payment Method Affect the Deal?

The two sections above give you the high-level overview of why a company might buy another company, and how to model an acquisition.

It's important to understand those, but you also need to understand the **trade-offs** behind different methods of financing an acquisition.

Let's start with the obvious: if a buyer pays **more** for a seller, the deal will be **more dilutive** (or less accretive), assuming that the mix of cash/stock/debt stays the same.

A deal will generally be **dilutive** if the amount of extra Pre-Tax Income the seller contributes is *not* enough to offset the foregone interest on cash, the cash paid on Debt, and the effects of issuing shares. Here's an example:

- It's a 50 / 50 cash / debt deal.
- The seller contributes $100 in Pre-Tax Income.
- The buyer pays $80 in Interest on Debt.
- The buyer gives up $25 in Foregone Interest on Cash.
- This will be **dilutive** because the buyer gains $100 in Pre-Tax Income, but loses $105.

When you add a stock issuance to the mix t's more difficult to assess, but there *is* a rule of thumb even for that (keep reading).

The buyer almost always prefers to use **100% cash** when acquiring a seller because cash is cheaper than debt – and unlike issuing stock, it doesn't require the buyer to give up any ownership to the seller.

Sellers also tend to prefer **cash** because it's less risky than equity (the buyer's share price might plummet immediately after the deal is announced, reducing the purchase price).

However, the buyer is constrained because it may not *have* enough cash available to complete the purchase; it might have also earmarked the cash for other purposes, such as hiring more employees.

So if it needs to use debt and/or stock, it has to assess how much it can reasonably use. On the debt side, it will look at the percentages of debt used in recent, similar deals, as well as what its **Leverage Ratio** (Total Debt / EBITDA) will be, and whether or not it can reasonably meet its interest payments.

For stock issuances, it will look at how much ownership it's giving up and how much it's diluting existing shareholders.

For example, if it currently has 90 million shares outstanding but it's issuing 30 million shares to acquire another company, that's bound to make investors question whether they want to give up 25% of the company to the seller.

Share price is also a factor when issuing stock. A buyer will always prefer to issue stock when its shares are trading at **high levels**. If its share price were $100, for example, it only has to issue half as many shares as it would if its share price were $50 – and issuing half as many shares results in less dilution.

Rules of Thumb for Merger Models

Now we're about to make your life – and your interviews – easier by providing 2 rules of thumb that you can use to estimate accretion / dilution for all scenarios.

Rule #1: 100% Stock Deals and P / E Multiples

This one is simple: **in an all-stock deal, if the buyer has a higher P / E than the seller, the deal will be accretive; if the buyer has a lower P / E, it will be dilutive.**

Think of it like this: P / E = Equity Value / Net Income.

If the buyer's Equity Value is $100 and its Net Income is $10, its P / E is 10x. If you bought it, you'd be getting **$0.10 in earnings for each dollar you pay for it** (flip the P / E, so 1 / 10 = 10%).

If the seller's Equity Value is $80 and its Net Income is $10, its P / E is 8x. There, you'd be getting **$0.125 in earnings for each dollar you pay for the seller** (flip the P / E, so 1 / 8 = 12.5%).

You get "more for your money" with the seller because its P / E multiple is lower. Since the buyer would get more for each dollar invested in the seller than what it's currently earning for each dollar invested *in itself*, this acquisition is accretive.

This is a simplification. This rule assumes that the buyer and seller have the same tax rates, that there's no *premium* paid for the seller over its current share price, and that there are no other acquisition effects such as Depreciation & Amortization from Asset Write-Ups.

So this rule rarely holds up in the real world. However, **if the seller's P / E is *higher* than the buyer's P / E, you can be almost 100% certain that the deal will be dilutive**.

Rule #2: How to Determine Accretion / Dilution for All Deals

Now we'll show you a cool trick for determining accretion / dilution in all scenarios. First, let's define a few key variables:

- **Cost of Cash** = Foregone Interest Rate on Cash * (1 – Buyer Tax Rate)
- **Cost of Debt** = Interest Rate on Debt * (1 – Buyer Tax Rate)
- **Cost of Stock** = Reciprocal of the Buyer's P / E multiple, i.e. E / P or Net Income / Equity Value
- **Yield of Seller** = Reciprocal of the Seller's P / E multiple (ideally, the P /E multiple **at** the purchase price for the deal)

To determine whether a deal is accretive or dilutive, simply calculate the weighted "cost" for the buyer and compare it to the Yield of the Seller. If the Buyer's Cost exceeds the Seller's Yield, it's dilutive. Otherwise, it's accretive.

Foregone Cash Interest Rate:	0.5%		"Cost" of Cash:	0.3%
Buyer's P / E Multiple:	11.3 x		"Cost" of Issuing Stock:	8.9%
Debt Interest Rate:	3.0%		"Cost" of Debt:	2.1%
Weighted "Cost" of Acquisition for Buyer:	3.8%		"Yield" of Seller AT Purchase Price:	5.6%
Rough Approximation: The Deal Will Be....	**Accretive**	<----------	This ignores synergies, new amortization / depreciation, transaction fees, write-downs, etc. and ONLY factors in the foregone interest on cash, additional shares, and interest on new debt.	

Let's look at a few examples of this rule in action:

- The buyer has a P / E multiple of 12x and the seller's P / E multiple is 10x. The foregone interest rate on cash is 4% and the interest rate on new debt is 8%. The buyer's tax rate is 40%.
- Cost of Cash = 4% * (1 – 40%) = 2.4%
- Cost of Debt = 8% * (1 – 40%) = 4.8%
- Cost of Stock = 1 / 12 = 8.3%
- Yield of Seller = 1 / 10 = 10.0%

In this case, this rule tells us that the acquisition **will be accretive regardless of the cash / stock / debt mix used** – because none of the buyer's costs exceed the Yield of the Seller.

But look what happens if we have slightly different numbers:

- The buyer's P / E multiple is 8x and the seller's P / E multiple is 12x now. Everything else is the same.
- Cost of Cash = 4% * (1 – 40%) = 2.4%
- Cost of Debt = 8% * (1 – 40%) = 4.8%
- Cost of Stock = 1 / 8 = 12.5%
- Yield of Seller = 1 / 12 = 8.3%

In this case, the after-tax costs of debt and cash are less than the Seller's Yield of 8.3%, so a 100% debt acquisition or a 100% cash acquisition would both be accretive.

However, the **buyer's Cost of Stock is greater than the Yield of the Seller now, so a 100% stock acquisition would be dilutive**.

You can combine these rules to estimate what would happen in other scenarios, such as a 50/50 cash/stock deal, or a 33/33/33 cash/stock/debt deal – just calculate the **weighted average cost**.

One interesting implication of this rule: cash is not *necessarily* the cheapest way to acquire a company.

For example, if the buyer has an extremely high P / E multiple of 100x, the reciprocal would be 1%. And that 1% might very well be **lower** than the after-tax cost of cash for them (ex: 4% * (1 – 40%) = 2.4%.

The only problem with this shortcut is that it doesn't **account for other acquisition effects** – synergies, new D&A, and so on. Use it to quickly estimate what a deal will look like on a non-synergy, cash-only basis, rather than as a universal law.

Another **big problem** (we cover this in the Excel file and tutorial) is that this doesn't account for the **premium paid** for the seller, unless you use the **purchase price** for the Seller's Yield rather than its current share price.

Example: The seller's Net Income is $100 million and its market cap is $1 billion, so its P / E is 10x and its current Yield is 1 / 10, or 10%. However, if the buyer pays $1.5 billion for the seller, its Effective Yield would only be $100 million / $1.5 billion, or 6.7%.

This is really important to factor in for "real deal" scenarios, and you can review the Excel file and tutorial there for more details there.

Key Rule #4: Acquisition Effects and Synergies

What happens **after** an acquisition is equally as important as important as how you acquire a company in the first place.

Questions on this topic are much more likely if you've had **full-time work experience** already or you have **more advanced knowledge** from other sources.

But just to be complete, we'll discuss a few of the key points here (there's more coverage in the Advanced Questions and Answers toward the end).

Basic Acquisition Effects

Here are the 5 key acquisition effects that you need to know – these are fair game even for entry-level interviews:

1. **Foregone Interest on Cash** – The buyer loses the Interest it would have otherwise earned if it uses cash for the acquisition – so that reduces its Pre-Tax Income, Net Income, and EPS.
2. **Additional Interest on Debt** – The buyer pays additional Interest Expense if it uses debt, which reduces its Pre-Tax Income, Net Income, and EPS.
3. **Additional Shares Outstanding** – If the buyer pays with stock, it must issue additional shares, which will reduce its EPS.
4. **Combined Financial Statements** – After the acquisition, the seller's financial statements are added to the buyer's, with a few adjustments.
5. **Creation of Goodwill & Other Intangibles** – These Balance Sheet items represent the premium that the buyer paid over the seller's Shareholder's Equity, and are required to ensure that the Balance Sheet balances.

You can calculate the impact of the first 3 effects using the rule outlined above: for the first two, multiply the interest rate by (1 – Buyer's Tax Rate), and for the impact of issuing stock, flip the P / E multiple of the buyer.

More Advanced Acquisition Effects

Then there are a few additional effects that you see in more advanced merger models. These are unlikely to come up in entry-level interviews, but there's no such thing as being overly prepared:

- **PP&E and Fixed Asset Write-Ups** – You may write up the values of these Assets in an acquisition, under the assumption that the market values exceed the book values.
- **Deferred Tax Liabilities** – Normally you write off the seller's existing DTLs, and then create new ones based on Buyer's Tax Rate * (PP&E and Fixed Asset Write-Up and Newly Created Intangibles). See the Advanced Questions for more.

- **Deferred Tax Assets** – In most deals, you write these off completely, depending on the seller's tax situation; see the Advanced section.
- **Transaction and Financing Fees** – You *expense* legal and advisory fees and deduct them from Cash and Retained Earnings at the time of the transaction, but you **capitalize** financing fees and then amortize them 5-10 years, or as long as newly issued Debt remains on the Balance Sheet.
- **Inter-Company Accounts Receivable and Accounts Payable** – You may eliminate some of the combined AR and AP balances because the buyer might owe the seller money and vice versa. Once they're the same company, this no longer makes sense.
- **Deferred Revenue Write-Down** – Accounting rules state that you can only recognize the *profit portion* of the seller's Deferred Revenue post-acquisition. So you often write down the *expense portion* of the seller's Deferred Revenue over several years in a merger model.

Another important feature in more advanced merger models is the treatment Net Operating Losses (NOLs) and book vs. cash taxes; see the Advanced section for more on those.

Revenue and Expense Synergies

By combining forces, two companies may earn *more* revenue than if they simply added together their separate revenues, or they may pay *fewer* expenses as a result of consolidation.

You could model **revenue synergies** by assuming a price increase or by assuming additional volume sold.

For example, maybe as a result of acquiring Company B, Company A can add new features to its products that result in customers paying $105 rather than $100 for each unit – you could then multiply that difference by the units sold each year to estimate the annual revenue synergies.

Revenue synergies are rarely taken seriously in practice because it's impossible to predict how successful these types of up-sell / cross-sell efforts will be.

Expense synergies are much more grounded in reality, and are easier to estimate. The two most common expense synergies:

- **Reduction in Force:** This is a nice way of saying, "Lay off employees." Often, two companies will have redundant employees in administrative functions – accounting, bookkeeping, marketing, and so on, and they can reduce expenses by eliminating redundant positions.
- **Building Consolidation:** If the buyer and seller both lease buildings in the same city, it makes sense to consolidate into one larger space and save on rent – or in the case of owned buildings, save on loan payments and property taxes.

You might estimate expense synergies by finding, for example, that each employee costs $100,000 per year, including salary, benefits, and other compensation, and then assuming that 5% of the workforce can be cut.

5% represents 30 employees, so that is a savings of $3 million per year.

Key Rule #5: M&A in the Real World

Understanding merger models is great, but you also need to grasp **how they work in real life** and how bankers and other financiers actually use them.

First off, realize that **no deal ever happens because of the output of an Excel model**.

Financial modeling gives you an idea of whether a deal might be viable, or whether a company might be undervalued or overvalued, for example, but no

one would ever say, "Aha! This deal is 12% accretive according to my Excel model! Let's do it!"

Merger models are used more for **supporting evidence** in negotiations and M&A discussions – not as a way to make decisions in the first place.

Acquisitions Gone Bad

Another harsh fact of life is that **most M&A deals fail**. It's tough to merge two completely different organizations, and there are many factors that could lead to failure:

- **Integration Difficulties** – On paper it might have seemed like a great move, but in practice integrating two separate employee bases, supply chains, retail networks, and so on can prove incredibly difficult. And if companies can't integrate properly, the deal will fail.
- **Cultural Differences** – While bankers like to think otherwise, a company is more than just revenue and profit in Excel. If two companies have radically different cultures (e.g. one is very relaxed and casual and one is stuffy and uptight), it will be challenging, if not impossible, for employees to work together successfully.
- **Poor Rationale** – Perhaps the original reason that the buyer gave to justify the acquisition made no sense in the first place. It sounds crazy, but huge deals really do happen for poor-to-nonexistent reasons. And when it becomes clear that the original reasoning made no sense, the deal works out poorly for everyone.
- **Synergy Failures** – Maybe the buyer acquired the seller to access its wonderfully lucrative customer base… only to find that the customer base does not, in fact, want any of its products. Whoops.

Overpaying for Companies

Another common "failure" scenario happens when the buyer **overpays** for the seller.

To see examples of this, just look up hyped tech start-up M&A deals and you'll see examples of absurd multiples or companies with 0 revenue and profit being acquired for tens or hundreds of millions (or billions) of dollars.

In these cases, enormous Goodwill & Other Intangible Asset balances get created… and afterward, there are often **Impairment Charges** and **Write-Downs** as the buyer re-assesses what the seller was really worth.

Maybe they record $500 million of Goodwill initially, but then they re-assess it in 1-2 years and record a $100 million Impairment Charge, which reduces (book) Pre-Tax Income, Net Income, and Goodwill.

Sometimes the impact is more immediate as well – for example, if a public company is acquiring another company using a significant amount of stock, the market almost always has a **strong reaction** to news of any deal.

If the buyer pays $100 million worth of stock for the seller but the market believes the seller is only worth $80 million, the buyer's stock price will inevitably fall once the deal is announced.

Its share price would *not* fall by 20% necessarily, but rather by the per-share amount that corresponds to this $20 million difference in value.

Example: The buyer is worth $1 billion, has 100 million shares outstanding, and its current share price is $10.00. It wants to issue 10 million shares to acquire the seller for $100 million.

But if the market believes that the seller is only worth $80 million rather than $100 million, the buyer's share price might fall to $9.81 (implying a total value of $1.08 billion) to reflect this lower value.

Moral of the Story: There are many ways for M&A deals to fail and to have disastrous consequences after the fact.

This is why it's so important to use sensitivities to analyze deal scenarios such as different purchase prices, synergy levels, cash/stock/debt combinations, and more. You want to ensure that even in the *worst case scenario*, the deal won't be a complete disaster.

Hardly anyone ever thinks about these dangers in real life because they're incentivized to get deals done at any cost.

For Further Learning

The rules above are a great start, but sometimes you need more: if you're in this position, click here to check out our Financial Modeling Fundamentals course.

You receive a $50 discount as a *Breaking Into Wall Street* member, and you get 20 hours of video tutorials along with several **bonus case studies** on real M&A deals and leveraged buyouts.

It has been one of our most popular courses year after year, and it's a great way to extend your knowledge of merger models, practice with real case studies based on M&A deals involving large companies, and prepare for interviews more intensively.

Merger Model – Excel Model

This file will be *very* useful for understanding how different variables, such as interest rates, profit margins, and P / E multiples, impact the output of a merger model.

This one is not quite as useful for understanding the merger model **concept**, but we've been through that in detail above.

Play around with these assumptions, tweak the numbers, and see how everything changes as a result – and what the results tell you about M&A deals in real life.

You can get the full model right here:

- United / Goodrich – Merger Model (Excel) and Video Tutorial

Merger Model Interactive Quiz

The interactive quiz here is more extensive than what we provide in other sections of the guide, because merger models are a deep topic and there are many different angles to cover.

There aren't quite as many "calculation" questions because **conceptual questions** on merger models are more likely in interviews.

Once again, this quiz is divided into sections on Basic and Advanced questions. For entry-level interviews you should focus on the Basic questions. The Advanced questions address M&A in-depth, but many *interviewers* won't even know all the material covered in this quiz.

- Basic Merger Model Quiz
- Advanced Merger Model Quiz

Merger Model Questions & Answers – Basic

It's no longer enough to know the basic concept behind a merger model and how you can use cash, debt, and stock to acquire a company.

Especially now that more interview prep **resources** are available, interviewers have started asking twists and variations on common questions.

So even if the concepts are "basic," the explanations and rationale behind each answer may be far from "basic."

We address the most common topic areas in this section and go through dozens of example questions with detailed explanations for each one.

Concept and Overview Questions

1. Why would a company want to acquire another company?

A company would acquire another company if it believes it will earn a good **return on its investment** – either in the form of a literal ROI, or in terms of a higher Earnings Per Share (EPS) number, which appeals to shareholders.

There are several reasons why a buyer might believe this to be the case:

- The buyer wants to **gain market share** by buying a competitor.
- The buyer needs to **grow more quickly** and sees an acquisition as a way to do that.
- The buyer believes the seller is **undervalued**.
- The buyer wants to acquire the **seller's customers** so it can up-sell and cross-sell products and services to them.
- The buyer thinks the seller has a critical technology, **intellectual property**, or other "secret sauce" it can use to significantly enhance its business.
- The buyer believes it can achieve significant **synergies** and therefore make the deal accretive for its shareholders.

2. Walk me through a basic merger model.

"A merger model is used to analyze the financial profiles of 2 companies, the purchase price and how the purchase is made, and it determines whether the buyer's EPS increases or decreases afterward.

Step 1 is making assumptions about the acquisition – the price and whether it was done using cash, stock, debt, or some combination of those. Next, you determine the valuations and shares outstanding of the buyer and seller and project the Income Statements for each one.

Finally, you combine the Income Statements, adding up line items such as Revenue and Operating Expenses, and adjusting for Foregone Interest on Cash and Interest Paid on Debt in the Combined Pre-Tax Income line; you apply the buyer's Tax Rate to get the Combined Net Income, and then divide by the new share count to determine the combined EPS."

You could also add in the part about Goodwill and combining the Balance Sheets, but it's best to start with answers that are as simple as possible at first.

3. What's the difference between a merger and an acquisition?

There's always a **buyer** and a **seller** in any M&A deal – the difference is that in a merger the companies are similarly-sized, whereas in an acquisition the buyer is significantly larger (often by a factor of 2-3x or more).

Also, 100% stock (or majority stock) deals are more common in mergers because similarly sized companies rarely have enough cash to buy each other, and cannot raise enough debt to do so either.

4. Why would an acquisition be dilutive?

An acquisition is dilutive if the additional Net Income the seller contributes is not enough to offset the buyer's foregone interest on cash, additional interest paid on debt, and the effects of issuing additional shares.

Acquisition effects – such as the amortization of Other Intangible Assets – can also make an acquisition dilutive.

5. Is there a rule of thumb for calculating whether an acquisition will be accretive or dilutive?

Yes, here it is:

- **Cost of Cash** = Foregone Interest Rate on Cash * (1 – Buyer Tax Rate)
- **Cost of Debt** = Interest Rate on Debt * (1 – Buyer Tax Rate)
- **Cost of Stock** = Reciprocal of the buyer's P / E multiple, i.e. E / P or Net Income / Equity Value.
- **Yield of Seller** = Reciprocal of the seller's P / E multiple (ideally calculated using the purchase price rather than the seller's current share price).

You calculate each of the Costs, take the weighted average, and then compare that number to the **Yield of the Seller** (the reciprocal of the seller's P / E multiple).

If the weighted "Cost" average is **less than** the Seller's Yield, it will be accretive since the purchase itself "costs" less than what the buyer gets out of it; otherwise it will be dilutive.

Example: The buyer's P / E multiple is 8x and the seller's P / E multiple is 10x. The buyer's interest rate on cash is 4% and interest rate on debt is 8%. The buyer is paying for the seller with 20% cash, 20% debt, and 60% stock. The buyer's tax rate is 40%.

- Cost of Cash = 4% * (1 – 40%) = 2.4%
- Cost of Debt = 8% * (1 – 40%) = 4.8%
- Cost of Stock = 1 / 8 = 12.5%
- Yield of Seller = 1 / 10 = 10.0%

Weighted Average Cost = 20% * 2.4% + 20% * 4.8% + 60% * 12.5% = 8.9%.

Since 8.9% is less than the Seller's Yield, this deal will be **accretive**.

6. Wait a minute, though, does that formula really work all the time?

Nope. There are a number of assumptions here that rarely hold up in the real world: the seller and buyer have the same tax rates, there are no other acquisition effects such as new Depreciation and Amortization, there are no transaction fees, there are no synergies, and so on.

And most importantly, the rule truly breaks down if you use the seller's current share price rather than the price the buyer is paying to purchase it.

It's a great way to quickly assess a deal, but it is **not** a hard-and-fast rule.

7. A company with a higher P/E acquires one with a lower P/E – is this accretive or dilutive?

Trick question. You can't tell unless you *also* know that it's an all-stock deal. If it's an all-cash or all-debt deal, the P / E multiple of the buyer doesn't matter because no stock is being issued.

If it *is* an all-stock deal, then the deal will be accretive since the buyer "gets" more in earnings for each $1.00 used to acquire the other company than it does from its own operations. The opposite applies if the buyer's P / E multiple is lower than the seller's.

8. Why do we focus so much on accretion / dilution? Is EPS really that important? Are there cases where it's not relevant?

EPS is important mostly because institutional investors value it and base many decisions on EPS and P / E multiples – not the best approach, but it is how they think.

A merger model has many purposes *besides* just calculating EPS accretion / dilution – for example, you could calculate the IRR of an acquisition if you assume that the acquired company is resold in the future, or even that it generates cash flows indefinitely into the future.

An equally important part of a merger model is assessing what the combined financial statements look like and how key items change.

So it's not that EPS accretion / dilution is the *only* important point in a merger model – but it is what's most likely to come up in interviews.

Price and Purchase Methods

1. How do you determine the Purchase Price for the target company in an acquisition?

You use the same Valuation methodologies we discussed in the Valuation section. If the seller is a public company, you would pay more attention to the **premium paid** over the current share price to make sure it's "sufficient" (generally in the 15-30% range) to win shareholder approval.

For private sellers, more weight is placed on the traditional methodologies.

2. All else being equal, which method would a company *prefer* to use when acquiring another company – cash, stock, or debt?

Assuming the buyer had unlimited resources, it would almost always prefer to use **cash** when buying another company. Why?

- Cash is **cheaper than debt** because interest rates on cash are usually under 5% whereas debt interest rates are almost always higher than that. Thus, foregone interest on cash is almost always **less** than the additional interest paid on debt for the same amount of cash or debt.
- Cash is almost always **cheaper than stock** because most companies' P / E multiples are in the 10 – 20x range… which equals a 5-10% "Cost of Stock."

- Cash is also **less risky than debt** because there's no chance the buyer might fail to raise sufficient funds from investors, or that the buyer might default.
- Cash is also **less risky than stock** because the buyer's share price could change dramatically once the acquisition is announced.

3. You said "almost always" above. So could there be cases where cash is actually *more* expensive than debt or stock?

With debt this is impossible because it makes no logical sense: why would a bank ever pay *more* on cash you've deposited than it would charge to customers who need to borrow money?

With stock it is *almost* impossible, but sometimes if the buyer has an *extremely* high P / E multiple – e.g. 100x – the reciprocal of that (1%) might be lower than the after-tax cost of cash. **This is rare**. **Extremely rare.**

4. If a company were capable of paying 100% in cash for another company, why would it choose NOT to do so?

It might be saving its cash for something else, or it might be concerned about running low on cash if business takes a turn for the worst.

Its stock may also be trading at an all-time high and it might be eager to use that "currency" instead, for the reasons stated above: stock is less expensive to issue if the company has a high P / E multiple and therefore a high stock price.

5. How much debt could a company issue in a merger or acquisition?

You would look at Comparable Companies and Precedent Transactions to determine this. You would use the combined company's EBITDA figure, find the median Debt / EBITDA ratio of the companies or deals you're looking at, and apply that to the company's own EBITDA figure to get a rough idea of how much debt it could raise.

You could also look at "Debt Comps" for similar, recent deals and see what types of debt and how many tranches they have used.

6. When would a company be MOST likely to issue stock to acquire another company?

1. The buyer's stock is trading at an all-time high, or at least at a very high level, and it's therefore "cheaper" to issue stock than it normally would be.
2. The seller is almost as large as the buyer and it's impossible to raise enough debt or use enough cash to acquire the seller.

7. Let's say that a buyer doesn't have enough cash available to acquire the seller. How could it decide between raising debt, issuing stock, or some combination of those?

There's no simple rule to decide – key factors include:

- **The relative "cost"** of both debt and stock. For example, if the company is trading at a higher P / E multiple it may be cheaper to issue stock (e.g. P / E of 20x = 5% cost, but debt at 10% interest = 10% * (1 – 40%) = 6% cost.
- **Existing debt**. If the company already has a high debt balance, it likely can't raise as much new debt.
- **Shareholder dilution**. Shareholders do not like the dilution that comes with issuing new stock, so companies try to minimize this.
- **Expansion plans**. If the buyer expands, begins a huge R&D effort, or buys a factory in the future, it's less likely to use cash and/or debt and more likely to issue stock so that it has enough funds available.

8. Let's say that Company A buys Company B using 100% debt. Company B has a P / E multiple of 10x and Company A has a P / E multiple of 15x. What interest rate is required on the debt to make the deal dilutive?

- Company A Cost of Stock = 1 / 15 = 6.7%
- Company B Yield = 1 / 10 = 10.0%

Therefore, the *after-tax Cost of Debt* must be **above 10%** for the acquisition cost to exceed Company B's Yield.

10% / (1 – 40%) = 16.7%, so we can say "above approximately 17%" for the answer. That is an exceptionally high interest rate, so a 100% debt deal here would almost certainly be accretive instead.

9. Let's go through another M&A scenario. Company A has a P / E of 10x, which is higher than the P / E of Company B. The interest rate on debt is 5%. If Company A acquires Company B and they both have 40% tax rates, should Company A use debt or stock for the most accretion?

- Company A Cost of Debt = 5% * (1 – 40%) = 3%
- Company A Cost of Stock = 1 / 10 = 10%
- Company B Yield = *Higher* than 10% since its P / E multiple is *lower*

Therefore, this deal will always be accretive regardless of whether Company A uses debt or stock since both "cost" less than Company B's Yield.

However, Company A will achieve **far more accretion** if it uses 100% debt because the Cost of Debt (3%) is much lower than the Cost of Stock (10%).

10. This is a multi-part question. Let's look at another M&A scenario:

- **Company A:** Enterprise Value of 100, Market Cap of 80, EBITDA of 10, Net Income of 4.
- **Company B:** Enterprise Value of 40, Market Cap of 40, EBITDA of 8, Net Income of 2.

First, calculate the EV / EBITDA and P / E multiples for each one.

- **Company A:** EV / EBITDA = 100 / 10 = 10x, P / E = 80 / 4 = 20x.
- **Company B:** EV / EBITDA = 40 / 8 = 5x, P / E = 40 / 2 = 20x.

11. Good. Now, Company A decides to acquire Company B using 100% cash. Company A does NOT pay any kind of premium to acquire Company B. What are the combined EBITDA and P / E multiples?

In this scenario, Company B's Market Cap gets wiped out because it no longer exists as an independent entity, and Company A's cash balance decreases because it has used its cash to acquire Company B.

So, the Combined Market Cap = 80. Previously, A had 20 *more* Debt than Cash, and B had the same amount of Cash and Debt.

To get real numbers here, let's just say that A had 60 of Debt and 40 of Cash. Afterward, the Debt remains at 60 but all the cash is gone because it used the Cash to acquire B. We don't need to look at B's numbers at all because its Cash and Debt cancel each other out.

So the Combined Enterprise Value = 80 + 60 = 140. It is no coincidence, of course, that Combined Enterprise Value = Company A Enterprise Value + Company B Enterprise Value. That is how it should always work in an acquisition where there was no premium paid for the seller.

You **add** the EBITDA and Net Income from both companies to get the combined figures. This is not 100% accurate because Interest Income changes for Company A since it's using cash and because the tax rates may be different, but we're going to ignore those for now since the impact will be small:

- Combined EV / EBITDA = 140 / (10 + 8) = 140 / 18 = 7.8x.
- Combined P / E = 80 / (4 + 2) = 80 / 6 = 13.3x.

12. Now, let's say that Company A instead uses 100% debt, at a 10% interest rate and 25% tax rate, to acquire Company B. Again, Company A pays no premium for Company B. What are the combined multiples?

Once again, Company B's Market Cap gets wiped out since it no longer exists as an independent entity.

So Combined Market Cap = 80.

The combined company has 40 of additional Debt, so if we continue with the assumption that A has 60 of Debt and 40 of Cash the Enterprise Value is 80 + 60 + 40 – 40 = 140, the same as in the previous example (**Important:** Regardless of the purchase method, the combined Enterprise Value stays the same).

The Combined EBITDA is still 18, so EV / EBITDA = 140 / 18 = 7.8x.

But the combined Net Income has changed. Normally, Company A Net Income + Company B Net Income = 6…

But now we have 40 of debt at 10% interest, which is 4, and when multiplied by (1 – 25%), equals 3. So Net Income falls to 3, and Combined P / E = 80 / 3 = 26.7x.

13. What was the point of this scenario and these questions? What does it tell you about valuation multiples and M&A activity?

There are a few main takeaways from this exercise:

1. Regardless of the purchase method (cash, stock, debt, or some combination of those), the Combined Enterprise Value for the new entity stays the same.
2. Company B's Market Cap (and the book version of it – Shareholders' Equity) always gets wiped out when it is acquired (technically, whenever the acquisition is for over 50% of Company B).
3. Regardless of the purchase method, the Combined EV / EBITDA multiple does not change because Combined Enterprise Value always stays the same and because the Combined EBITDA is not affected by changes in interest or additional shares outstanding.

14. Why would a strategic acquirer typically be willing to pay more for a company than a private equity firm would?

Because the strategic acquirer can realize revenue and cost synergies that the private equity firm cannot unless it combines the company with a complementary portfolio company. Those synergies make it easier for the strategic acquirer to pay a higher price and still realize a solid return on investment.

Acquisition Effects and Synergies

1. What are the effects of an acquisition?

1. **Foregone Interest on Cash** – The buyer loses the Interest it would have otherwise earned if it uses cash for the acquisition.
2. **Additional Interest on Debt** – The buyer pays additional Interest Expense if it uses debt.
3. **Additional Shares Outstanding** – If the buyer pays with stock, it must issue additional shares.
4. **Combined Financial Statements** – After the acquisition, the seller's financial statements are added to the buyer's.
5. **Creation of Goodwill & Other Intangibles** – These Balance Sheet items that represent the premium paid to a seller's Shareholders' Equity also get created.

There's more to it than this (see the Advanced section), but this is usually sufficient to mention in interviews.

2. Why do Goodwill & Other Intangibles get created in an acquisition?

These represent the amount that the buyer has paid *over* the book value (Shareholders' Equity) of the seller. You calculate the number by subtracting the seller's Shareholders' Equity (technically the Common Shareholders' Equity) from the Equity Purchase Price.

Goodwill and Other Intangibles represent the value of customer relationships, employee skills, competitive advantages, brand names, intellectual property, and so on – valuable, but not physical Assets in the same way factories are.

3. What is the difference between Goodwill and Other Intangible Assets?

Goodwill typically stays the same over many years and is not amortized. It changes only if there's Goodwill Impairment (or another acquisition).

Other Intangible Assets, by contrast, are amortized over several years and affect the Income Statement by reducing Pre-Tax Income.

Technically, Other Intangible Assets might represent items that "expire" over time, such as copyrights or patents, but you do not get into that level of detail as a banker – it's something that accountants and auditors would determine post-acquisition.

4. What are some more advanced acquisition effects that you might see in a merger model?

- **PP&E and Fixed Asset Write-Ups** – You may write up the values of these Assets in an acquisition, under the assumption that the market values exceed the book values.
- **Deferred Tax Liabilities and Deferred Tax Assets** – You may adjust these up or down depending on the asset write-ups and deal type.
- **Transaction and Financing Fees** – You also need to factor in these fees into the model somewhere.
- **Inter-Company Accounts Receivable and Accounts Payable** – Two companies "owing" each other cash no longer makes sense after they've become the same company.
- **Deferred Revenue Write-Down** – Accounting rules state that you can only recognize the *profit portion* of the seller's Deferred Revenue post-acquisition. So you often write down the *expense portion* of the seller's Deferred Revenue over several years in a merger model.

You do **not** need to know all the details for entry-level interviews, but you should be aware that there are more advanced adjustments in M&A deals.

5. What are synergies, and can you provide a few examples?

Synergies refer to cases where 2 + 2 = 5 (or 6, or 7…) in an acquisition. The buyer gets **more value than out of an acquisition than what the financials would otherwise suggest.**

There are 2 types: **revenue synergies** and **cost (or expense) synergies.**

- **Revenue Synergies:** The combined company can cross-sell products to new customers or up-sell additional products to customers. It might also be able to expand into new geographies as a result of the deal.
- **Expense Synergies:** The combined company can consolidate buildings and administrative staff and can lay off redundant employees. It might also be able to shut down redundant stores or locations.

6. How are synergies used in merger models?

- **Revenue Synergies:** Normally you add these to the Revenue figure for the combined company and then assume a certain **margin** on the Revenue (all additional Revenue costs something) – this additional Revenue then flows through the rest of the combined Income Statement, and you reflect the additional expenses as well.
- **Expense Synergies:** Normally you reduce the combined COGS or Operating Expenses by this amount, which in turn boosts the combined Pre-Tax Income and Net Income, increasing the EPS and making the deal more accretive.

7. Are revenue or expense synergies more important?

Revenue synergies are rarely taken seriously because they're so hard to predict. Expense synergies are taken a bit more seriously because it's more straightforward to see how buildings and locations might be consolidated and how many redundant employees might be eliminated.

Real World Scenarios

1. Let's say a company overpays for another company – what happens afterward?

A high amount of Goodwill & Other Intangibles would be created if the purchase price is far above the Shareholders' Equity of the target. In the years following the acquisition, the buyer may record a large Goodwill Impairment Charge if it reassesses the value of the seller and finds that it truly overpaid.

2. A buyer pays $100 million for the seller in an all-stock deal, but a day later the market decides that it's only worth $50 million. What happens?

The buyer's share price would fall by whatever per-share dollar amount corresponds to the $50 million loss in value. It would *not* necessarily be cut in half.

Depending on the deal structure, the seller would effectively only receive **half** of what it had originally negotiated.

This illustrates one of the major risks of all-stock deals: sudden changes in share price could dramatically impact the valuation (there are ways to hedge against that risk – see the Advanced section).

3. Why do most mergers and acquisitions fail?

M&A is "easier said than done." In practice it's very difficult to acquire and integrate a different company, realize synergies, and also turn the acquired company into a profitable division.

Many deals are also done for the wrong reasons, such as the CEO's massive ego or pressure from shareholders. Any deal done **without** both parties' best interests in mind is likely to fail.

4. What role does a merger model play in deal negotiations?

The model is used as a sanity check and as a way to test various assumptions. A company would **never** decide to do a deal because of the output of a model.

It might say, "OK, the model tells us this deal could work and would be moderately accretive – it's worth exploring in more detail."

It would never say, "Aha! This model predicts 21% accretion – we should have acquired this company yesterday!"

Emotions, ego and personalities play a far bigger role in M&A than numbers do.

5. What types of sensitivities would you look at in a merger model? What variables would you analyze?

The most common variables to analyze are **Purchase Price**, **% Stock/Cash/Debt**, **Revenue Synergies**, and **Expense Synergies**. Sometimes you also look at different operating sensitivities, like Revenue Growth or EBITDA Margin, but it's more common to build these into your model as different scenarios instead.

You might look at sensitivity tables showing the EPS accretion/dilution at different ranges for the **Purchase Price vs. Cost Synergies**, **Purchase Price vs. Revenue Synergies**, or **Purchase Price vs. % Cash** (and so on).

6. If the seller has existing Debt on its Balance Sheet in an M&A deal, how do you deal with it?

You assume that the Debt either stays on the Balance Sheet or is refinanced (paid off) in the acquisition. The terms of most Debt issuances state that they must be repaid in a "change of control" scenario (i.e. when a buyer acquires over 50% of a company), so you often assume that the Debt is paid off in a deal.

That increases the price that the buyer needs to pay for the seller.

7. Wait a minute. If you use Cash or Debt to acquire another company, it's clear how you could use them to pay off existing Debt… but how does that work with Stock?

Remember what happens when a company issues shares: it sells the shares to new investors and **receives cash** in exchange for them. Here, they would do the same thing and issue a small portion of the shares to 3rd party investors rather than the seller to raise the cash necessary to repay the debt.

The buyer might also wait until the deal closes before it issues additional shares to pay off the debt. And it could also use cash on-hand to repay the debt, or refinance the debt with a new debt issuance.

Merger Model Questions & Answers – Advanced

You should study this section **only** if you have significant experience working on M&A deals and advising buyers and sellers, because these questions are **advanced** and not terribly likely to come up in interviews.

We are including them here because anything is fair game, especially if you've listed specific M&A transactions on your resume / CV and have gone into detail on your role in them.

A few of these questions are **extremely advanced to the point of obscurity** and go beyond what most junior bankers in the industry would even know.

But then, you signed up for this guide because you wanted the most comprehensive interview prep resource around, right?

Purchase Price Allocation and Sources & Uses

1. What's the purpose of Purchase Price Allocation in an M&A deal? Can you explain how it works?

The ultimate purpose is to **make the combined Balance Sheet balance**.

This harder than it sounds because many items get adjusted up or down (e.g. PP&E), some items disappear altogether (e.g. the seller's Shareholders' Equity), and some new items get created (e.g. Goodwill).

To complete the process, you look at every single item on the seller's Balance Sheet and then **assess the fair market values** of all those items, adjusting them up or down as necessary.

So if the buyer pays, say, $1 billion for the seller, you figure out how much of that $1 billion gets allocated to each Asset on the Balance Sheet.

Goodwill (and Other Intangible Assets) serves as the "plug" and ensures that both sides balance you've made all the adjustments. Goodwill is roughly equal to the Equity Purchase Price minus the seller's Shareholders' Equity and other adjustments.

2. Explain the complete formula for how to calculate Goodwill in an M&A deal.

Goodwill = Equity Purchase Price – Seller Book Value + Seller's Existing Goodwill – Asset Write-Ups – Seller's Existing Deferred Tax Liability + Write-Down of Seller's Existing Deferred Tax Asset + Newly Created Deferred Tax Liability + Intercompany Accounts Receivable – Intercompany Accounts Payable

A couple notes here:

- Seller Book Value is just the Shareholders' Equity number (technically, the *Common* Shareholders' Equity number).
- You **add** the Seller's Existing Goodwill because it is "reset" and written down to $0 in an M&A deal.
- You subtract the Asset Write-Ups because these are **additions** to the Assets side of the Balance Sheet – Goodwill is also an asset, so effectively you need less Goodwill to "plug the hole."
- Normally you assume 100% of the Seller's existing DTL is written down.

- The seller's existing DTA may or may not be written down completely (keep reading this section).
- You **add** Intercompany Accounts Receivable because they go away, which reduces the Assets side; the opposite applies for Intercompany AP.

3. Why do we adjust the values of Assets such as PP&E in an M&A deal?

Because often the fair market value is significantly different from the Balance Sheet value. A perfect example is **real estate** – usually it appreciates over time, but due to the rules of accounting, companies must depreciate it on the Balance Sheet and show a declining balance over time to reflect the allocation of costs over a long time period.

Investments, Inventory, and other Assets may have also "drifted" from their fair market values since the Balance Sheet is recorded at historical cost for companies in most industries (exceptions, such as commercial banking, do exist).

4. What's the logic behind Deferred Tax Liabilities and Deferred Tax Assets?

We go into this in more detail in the upcoming section on Deferred Taxes and NOLs.

The basic idea is that you normally write down most of the seller's existing DTLs and DTAs to "reset" its tax basis, since it's now part of another entity.

And then you may create new DTLs or DTAs if there are Asset Write-Ups or Write-Downs and the book and tax Depreciation and Amortization numbers differ.

If there are *write-ups*, a Deferred Tax Liability will be created in most deals since the Depreciation on the write-ups is not tax-deductible, which means that the company will pay more in cash taxes; the opposite applies for *write-downs* and there, a Deferred Tax Asset would be created.

See the section on NOLs and Deferred Taxes for more details.

5. How do you treat items like Preferred Stock, Noncontrolling Interests, Debt, and so on, and how do they affect Purchase Price Allocation?

Normally you build in the option to repay (or in the case of Noncontrolling Interests, purchase the remainder of) these items or assume them in the Sources & Uses schedule.

If you repay them, additional cash/debt/stock is required to purchase the seller.

However, that choice does *not* affect Purchase Price Allocation.

You *always* start with the Equity Purchase Price there, which excludes the treatment of all these items.

Also, you only use the seller's *Common* Shareholders' Equity in the PPA schedule, which excludes Preferred Stock and Noncontrolling Interests.

6. So do you use Equity Value or Enterprise Value for the Purchase Price in a merger model?

This is a trick question because neither one is entirely accurate. The PPA schedule is based on the Equity Purchase Price, but the actual amount of cash/stock/debt used is based on that Equity Purchase Price **plus** the additional funds needed to repay debt, pay for transaction-related fees, and so on.

That number is not exactly "Enterprise Value" – it's something in between Equity Value and Enterprise Value, and it's normally labeled "Funds Required" in a model.

7. How do you reflect transaction costs, financing fees, and miscellaneous expenses in a merger model?

You **expense** transaction and miscellaneous fees (such as legal and accounting services) upfront and **capitalize** the financing fees and amortize them over the term of the debt.

Expensed transaction fees come out of Retained Earnings when you adjust the Balance Sheet (and Cash on the other side), while Capitalized Financing Fees appear as a new Asset on the Balance Sheet (and reduce Cash immediately) and are amortized each year according to the tenor of the debt.

In reality, you pay for **all** of these fees upfront in cash. However, since financing fees correspond to a **long-term** item rather than a one-time transaction, they're amortized over time on the Balance Sheet. It's similar to how new CapEx spending is depreciated over time.

N**one of this affects Purchase Price Allocation**. These fees simply increase the "Funds Required" number discussed above, but they make **absolutely no impact on the Equity Purchase Price** or on the amount of Goodwill created.

8. How would you treat Debt differently in the Sources & Uses table if it is refinanced rather than assumed?

If the buyer **assumes** the Debt, it appears in both the Sources *and* Uses columns and has no effect on the Funds Required.

If the buyer **pays off** Debt, it appears only in the Uses column and increases the Funds Required.

Transaction Structures

1. What are the main 3 transaction structures you could use to acquire another company?

The 3 main structures are the Stock Purchase, Asset Purchase, and 338(h)(10) Election.

Note that Stock Purchases and Asset Purchases exist in some form in countries worldwide, but that the 338(h)(10) Election is specific to the US – however, there may be equivalent legal structures in other countries.

Here's how they differ:

Structure:	Stock Purchase	Asset Purchase	338(h)(10) Election
Buyer Acquires:	All Assets and Liabilities + Off-Balance Sheet Items	Only *Certain* Assets and Liabilities of the Seller	All Assets and Liabilities + Off-Balance Sheet Items
Seller Pays Taxes On:	Entire Purchase Price	Entire Purchase Price PLUS (Total Value Assigned to All Assets – Book Value of All Assets)	Entire Purchase Price PLUS (Total Value Assigned to All Assets – Book Value of All Assets)
Assets Written Up on Tax Balance Sheet?	No	Yes	Yes
Can Buyer Deduct New D&A from Written-Up Assets for Tax Purposes?	No	Yes	Yes
Creates DTL?	Yes	No	No
Most Common For:	Public companies and large private companies	Private companies, divestitures, distressed public companies	Private companies, divestitures, distressed public companies
Favored By:	Sellers	Buyers	Both

Part of the reason that both parties favor the 338(h)(10) structure is that buyers typically agree to pay **more** to compensate sellers for the favorable tax treatment they receive.

2. Would a seller prefer a Stock Purchase or an Asset Purchase? What about the buyer?

A **seller** almost always prefers a **Stock Purchase** to avoid double taxation and to dispose of all its Liabilities

The **buyer** almost always prefers an **Asset Purchase** so it can be more careful about what it acquires and to get the tax benefit from being able to deduct D&A on Asset Write-Ups for tax purposes.

However, it's not always possible to "pick" one or the other – for example, if the seller is a large public company only a Stock Purchase is possible in 99% of cases.

3. Why might a company want to use 338(h)(10) when acquiring another company?

A Section 338(h)(10) election blends the benefits of a Stock Purchase and an Asset Purchase:

- Legally it is a Stock Purchase, but **accounting-wise** it's treated like an Asset Purchase.
- The seller is still subject to **double-taxation** – capital gains on any Assets that have appreciated and on the proceeds from the sale.
- But the buyer receives a **step-up tax basis** on the new Assets it acquires, and it can depreciate and amortize them so it saves on taxes.

Even though sellers still get taxed twice, buyers will often pay more in a 338(h)(10) deal because of the **tax-savings potential**.

It's particularly helpful for:

- Sellers with **high NOL balances** (more tax-savings for the buyer because this NOL balance will be written down completely – so more of the excess purchase price can be allocated to Asset Write-Ups).
- Companies that have been **S-corporations for over 10 years** – in this case they do not have to pay taxes on the appreciation of their Assets.

The requirements to use 338(h)(10) are complex and it cannot always be used.

For example, if the **seller** is a C Corporation it can't be applied; also, if the **buyer** is *not* a C Corporation (e.g. a private equity firm), it also can't be used.

Net Operating Losses (NOLs) and Deferred Taxes

1. How do you take into account NOLs in an M&A deal?

You apply **Section 382** to determine how much of the seller's NOLs are usable each year.

- **Allowable Annual NOL Usage** = Equity Purchase Price * Highest of Past 3 Months' Adjusted Long-Term Rates

So if our Equity Purchase Price were $1 billion and the highest adjusted long-term rate were 5%, then we could use $1 billion * 5% = $50 million of NOLs each year.

If the seller had $250 million in NOLs, then the combined company could use $50 million of them each year for 5 years to offset its taxable income.

Here's a link to these adjusted long-term rates.

2. Why do deferred tax liabilities (DTLs) and deferred tax assets (DTAs) get created in M&A deals?

These get created when you write up assets – both tangible and intangible – and when you write down assets in a transaction. An asset **write-up** creates a **deferred tax liability**, and an asset **write-down** creates a **deferred tax asset**.

You write down and write up assets because their book values – what's on the Balance Sheet – often differ substantially from their "fair market values."

An asset write-up creates a deferred tax *liability* because you'll have a higher Depreciation expense on the new asset, which means you save on taxes in the short-term – but eventually you'll have to pay them back, so you get a liability.

The opposite applies for an asset write-down and a deferred tax *asset*.

3. How do DTLs and DTAs affect the Balance Sheet Adjustments in an M&A deal?

You take them into account with everything else when calculating the amount of Goodwill & Other Intangibles to create on your pro-forma Balance Sheet. The formulas are as follows:

- **Deferred Tax Asset** = Asset Write-Down * Tax Rate
- **Deferred Tax Liability** = Asset Write-Up * Tax Rate

So let's say you were buying a company for $1 billion with 50% cash and 50% debt, and you had a $100 million asset write-up and a tax rate of 40%. In addition, the seller has total Assets of $200 million, total Liabilities of $150 million, and Shareholders' Equity of $50 million.

Here's what would happen on the combined company's balance sheet (ignoring transaction and financing fees):

- First, you simply add the seller's Assets and Liabilities (but NOT Shareholders' Equity – it is wiped out) to the buyer's to get your "initial" Balance Sheet. Assets are up by $200 million and Liabilities are up by $150 million.

- Then, Cash on the Assets side goes down by $500 million.
- You have an Asset Write-Up of $100 million, so Assets go up by $100 million.
- Debt on the Liabilities & Equity side goes up by $500 million.
- You get a new Deferred Tax Liability of $40 million ($100 million * 40%) on the Liabilities & Equity side.
- Assets are down by $200 million total and Liabilities & Shareholders' Equity are up by $690 million ($500 + $40 + $150).
- So you need Goodwill & Intangibles of $890 million on the Assets side to make both sides balance.

4. Could you get DTLs or DTAs in an Asset Purchase?

No, because in an Asset Purchase the book basis of assets always matches the tax basis. DTLs and DTAs get created in Stock Purchases because the **book values** of Assets are written up or written down, but the **tax values** are not.

5. How do you factor in DTLs into forward projections in a merger model?

You create a book vs. cash tax schedule and figure out what the company owes in taxes based on the Pre-Tax Income on its books, and then you determine what it actually pays in cash taxes based on its NOLs and its new D&A expenses (from any Asset Write-Ups).

Anytime the "cash" tax expense exceeds the "book" tax expense you record this as a **decrease** to the Deferred Tax Liability on the Balance Sheet; if the "book" expense is higher, then you record that as an **increase** to the DTL.

Synergies

1. Can you give me an example of how you might calculate revenue synergies?

"Sure. Let's say that Company A sells 10,000 widgets per year in North America at an average price of $15.00, and Company B sells 5,000 widgets per year in Europe at an average price of $10.00. Company A believes that it can sell its own

widgets to 20% of Company B's customers, so after it acquires Company B it will earn an extra 20% * 5,000 * $15.00 in revenue, or $15,000.

It will also have expenses associated with those extra sales, so you need to reflect those as well – if it has a 50% margin, for example, it would reflect an additional $7,500, rather than $15,000, to Operating Income and Pre-Tax Income on the combined Income Statement."

This last point about **expenses** associated with revenue synergies is important and one that a lot of people forget – there's no such thing as "free" revenue with no associated costs.

2. Should you estimate revenue synergies based on the seller's customers and the seller's financials, or the buyer's customers and the buyer's financials?

Either one works. You could assume that the *buyer* leverages the seller's products or services and sells them to its own customer base – but typically you assume an uplift to the seller's average selling price, or something else that the buyer can do with the seller's existing customers.

You approach it that way because the buyer, as a larger company, can make more of an **immediate impact** on the seller than the seller can make on the buyer.

3. Walk me through an example of how to calculate expense synergies.

"Let's say that Company A wants to acquire Company B. Company A has 5,000 SG&A-related employees, whereas Company B has around 1,000. Company A calculates that post-transaction, it will only need about 800 of Company B's SG&A employees, and its existing employees can take over the rest of the work. To calculate the Operating Expenses the combined company would save, we would multiply these 200 employees that Company A is going to fire post-transaction by their average salary, benefits, and other compensation expenses."

4. How do you think about synergies if the combined company can consolidate buildings?

If the buildings are leased, you assume that both lease expenses go away and are replaced with a new, larger lease expense for the new or expanded building. So in that case it is a simple matter of New Lease Expense – Old, Separate Lease Expenses to determine the synergies.

If the buildings are owned, it gets more complicated because one or both of them will be sold, or perhaps leased out to someone else. Then you would have to look at Depreciation and Interest savings, as well as additional potential income if the building is rented out.

5. What if there are CapEx synergies? For example, what if the buyer can reduce its CapEx spending because of certain assets the seller owns?

In this case, you would start recording a lower CapEx charge on the combined Cash Flow Statement, and then reflect a reduced Depreciation charge on the Income Statement from that *new* CapEx spending each year.

You would not start seeing the results until Year 2 because reduced Depreciation only comes *after* reduced CapEx spending. This scenario would be much easier to model with a full PP&E schedule where you can adjust the spending and the resulting Depreciation each year.

Noncontrolling Interests, Equity Interests, and Divestitures

1. What happens when you acquire a 30% stake in a company? Can you still use an accretion / dilution analysis?

You record this 30% as an "Investment in Equity Interest" or "Associate Company" on the Assets side of the Balance Sheet, and you reduce Cash to reflect the purchase (assuming that Cash was used). You use this treatment for all ownership percentages between 20% and 50%.

You can still use an accretion / dilution analysis; just make sure that the new Net Income reflects the 30% of the other company's Net Income that you are entitled to.

2. What happens when you acquire a 70% stake in a company?

For all acquisitions where over 50% but less than 100% of another company gets acquired, you still go through the purchase price allocation process and create Goodwill, but you record a **Noncontrolling Interest** on the Liabilities side for the portion you do *not* own. You also consolidate 100% of the other company's statements with your own, even if you only own 70% of it.

Example: You acquire 70% of another company using Cash. The company is worth $100, and has Assets of $180, Liabilities of $100, and Equity of $80.

You add all of its Assets and Liabilities to your own, but you wipe out its Equity since it's no longer considered an independent entity. The Assets side is up by $180 and the Liabilities side is up by $100.

You also used $70 of Cash, so the Assets side is now only up by $110.

We allocate the purchase price here, and since 100% of the company was worth $100 but its Equity was only $80, we create $20 of Goodwill – so the Assets side is up by $130.

On the Liabilities side, we create a Noncontrolling Interest of $30 to represent the 30% of the company that we do *not* own. Both sides are up by $130 and balance.

3. Let's say that a company sells a subsidiary for $1000, paid for by the buyer in Cash. The buyer is acquiring $500 of Assets with the deal, but it's assuming no Liabilities. Assume a 40% tax rate. What happens on the 3 statements after the sale?

Income Statement: We record a Gain of $500, since we sold Balance Sheet Assets of $500 for $1,000. That boosts Pre-Tax Income by $500 and Net Income by $300 assuming a 40% tax rate.

Cash Flow Statement: Net Income is up by $300, but we subtract the Gain of $500 in the CFO section, so cash flow is down by $200 so far. We add the full amount of sale proceeds ($1000) in the CFI section, so cash at the bottom is up by $800.

Balance Sheet: Cash on the Assets side is up by $800, but we've lost $500 in Assets, so the Assets side is up by $300. On the other side, Shareholders' Equity is also up by $300 due to the increased Net Income.

In this scenario, you'd also have to go back and remove revenue and expenses from this sold-off division and label them "Discontinued Operations" on the financial statements prior to the close of the sale.

4. Now let's say that we decide to *buy* 100% of another company's subsidiary for $1000 in cash. This subsidiary has $500 in Assets and $300 in Liabilities, and we are acquiring all the Assets and assuming all the Liabilities. What happens on the statements immediately afterward?

Income Statement: No changes.

Cash Flow Statement: We record $1000 for "Acquisitions" in the CFI section, so cash at the bottom is down by $1000.

Balance Sheet: Cash is down by $1000 on the Assets side, but we add in the subsidiary's Assets of $500, so this side is down by $500 so far. We also create $800 worth of Goodwill because we bought this subsidiary for $1000, but (Assets Minus Liabilities) was only $200. So the Assets side is up by $300. The other side is up by $300 because of the assumed Liabilities, so both sides balance.

Calendarization and Stub Periods

1. What's the purpose of calendarization in a merger model?

You need to make sure that the buyer and seller use the **same fiscal years post-transaction**. Normally you change the seller's financial statements to match the buyer's.

If the buyer's fiscal year ends on December 31 and the seller's ends on June 30, for example, you would have to take quarter 3 (Jan – Mar) and quarter 4 (Apr – Jun) from the seller's most recent fiscal year and then add quarters 1 (Jul – Sep) and 2 (Oct – Dec) from the seller's current fiscal year to match the buyer's current fiscal year.

The second point here is that you may also need to create a **stub period** from the date when the deal closes to the end of the buyer's current fiscal year.

For example, if the deal closes on September 30 but the buyer's fiscal year ends on December 31, the buyer and seller are still one combined company for that 3-month period and you need to account for that, normally via a separate "stub period" right before the start of the first full fiscal year as a combined entity.

2. Let's say that the buyer's fiscal year ends on December 31, the seller's fiscal year ends on June 30, and the transaction closes on September 30. How would you create a merger model for this scenario?

You would need to create quarterly financial statements for both the buyer and sell for the September 30 – December 31 period, and you would show that as the first "combined" period in the merger model.

So you would combine the Income Statements, Balance Sheets, and Cash Flow Statements for that 3-month period, and then keep them combined for the rest of the time after that (adjusting the seller's financial statements to match the fiscal year of the buyer, as in the example above).

Normally you do not care much about accretion / dilution for stub periods like this, so you would just calculate it for the first full fiscal year after the transaction close.

3. Does anything change if the transaction closes on March 31 instead?

The only difference is that now you need a 9-month stub period rather than a 3-month stub period.

So you would need to find or create financial statements for Q4 of the seller's fiscal year ending June 30, and then Q1 and Q2 for the next year.

You would also take the last 3 quarters of the buyer's fiscal year and combine the statements from that period with the seller's, taking into account all the normal acquisition effects for that period.

4. What if the deal closes on a more "random" date, like August 17?

There are a couple options here; you could attempt to "roll-forward" the financial statements to this date in between quarterly end dates. For example, you might create an August 17 Balance Sheet by looking at the Balance Sheet as of June 30 and the Balance Sheet as of September 30 and averaging them (since August 17 is roughly in the middle).

For the Income Statement and Cash Flow Statement, you could just take the July 1 – September 30 quarterly numbers and multiply by (43 / 90) since 43 days of the quarter will pass in the "combined" period between August 17 and September 30.

The main problem is that this method creates a lot of extra work, because now you have to roll forward all the statements to this random date, figure out the numbers from that date to the end of the quarter, and then add additional quarters until the end of the buyer's fiscal year.

So in practice, you usually assume a **cleaner** close date in merger models unless you need 100% precision for some reason.

Deal Structures and Legal Points

1. What is an exchange ratio and when would companies use it in an M&A deal?

An exchange ratio is an alternate way of structuring a 100% stock M&A deal, or any M&A deal with a portion of stock involved.

Let's say you were going to buy a company for $100 million in a 100% stock deal. Normally you would determine the number of shares to issue by dividing the $100 million by the buyer's stock price.

With an exchange ratio, by contrast, you would **tie the number of new shares to the buyer's own shares** – so the seller might receive 1.5 shares of the buyer's shares for each of its shares, rather than shares worth a specific dollar amount.

Buyers might prefer to do this if they believe their stock price is going to decline post-transaction – sellers, on the other hand, would prefer a fixed dollar amount in stock unless they believe the buyer's share price will rise after the transaction.

2. Isn't there still some risk with an exchange ratio? If the stock price swings wildly in one direction or the other, the effective purchase price would be very different. Is there any way to hedge against that risk?

Yes. You can use something called a **collar**, which guarantees a certain price based on the range of the buyer's stock price to the seller's stock price. Here's an example:

Suppose that we had a 100% stock deal with a 1.5x exchange ratio, i.e. the seller receives 1.5 of the buyer's shares for each 1 of its own shares. The buyer's share price is $20.00 and the seller has 1,000 shares outstanding. Right now, it's worth $30,000 (1,000 * 1.5 * $20.00) to the seller. Here's how we could set up a collar:

- If the buyer's **share price falls below $20.00 per share**, the seller still receives the equivalent of $20.00 per buyer share in value. So if the buyer's

share price falls to $15.00, now the seller would receive 2,000 shares instead.

- If the buyer's **share price is between $20.00 and $40.00 per share**, the normal 1.5x exchange ratio is used. So the value could be anything from $30,000 to $60,000.
- If the buyer's **share price goes above $40.00 per share**, the seller can only receive the equivalent of $40.00 per buyer share in value. So if the buyer's share price rises to $80.00, the seller would receive only 750 shares instead.

Collar structures are not terribly common in M&A deals, but they are useful for reducing risk on both sides when stock is involved.

3. Walk me through the most important terms of a Purchase Agreement in an M&A deal.

There are dozens, but here are the most important points:

- **Purchase Price:** Stated as a per-share amount for public companies; just a number (the Equity Purchase Price) for private companies
- **Form of Consideration:** Cash, Stock, Debt…
- **Transaction Structure:** Stock, Asset, or 338(h)(10)
- **Treatment of Options:** Assumed by the buyer? Cashed out? Ignored?
- **Employee Retention:** Do employees have to sign non-solicit or non-compete agreements? What about management?
- **Reps & Warranties:** What must the buyer and seller claim is true about their respective businesses?
- **No-Shop / Go-Shop:** Can the seller "shop" this offer around and try to get a better deal, or must it stay exclusive to this buyer?

4. What's an Earnout and why would a buyer offer it to a seller in an M&A deal?

An Earnout is a form of "deferred payment" in an M&A deal – it's most common with private companies and start-ups, and it is **highly** unusual for public sellers.

It is usually contingent on financial performance or other goals – for example, the buyer might say, "We'll pay you an additional $10 million in 3 years if you can hit $100 million in revenue by then."

Buyers use it to incentivize sellers to continue to perform well and to discourage management teams from taking the money and running off to an island in the South Pacific once the deal is done.

More Advanced Analysis and Special Cases

1. Normally we create Goodwill because we pay more for a company than what its Shareholders' Equity says it's worth. But what if the opposite happens? What if we paid $1000 in Cash for a company, but its Assets were worth $2000 and its Liabilities were worth $800?

First off, you would reverse any new write-ups to Assets to handle this scenario the easy way, if possible. So if we had Asset Write-Ups of $300 then it would be easy to simply reverse those and make it so the Assets were only worth $1700, which would result in positive Goodwill instead.

If it is **not** possible to do that – e.g. there were no Asset Write-Ups or they cannot be reversed for some reason – then we need to record a Gain on the Income Statement for this "Negative Goodwill."

In this case, the company's Shareholders' Equity is $1200 but we paid $1000 for it, so we do the following:

Income Statement: Record a Gain of $200, boosting Pre-Tax Income by $200 and Net Income by $120 at a 40% tax rate.

Cash Flow Statement: Net Income is up by $120, but we subtract the Gain of $200, so Cash is down by $80 so far. Under CFI we record the $1000 acquisition, so Cash at the bottom is down by $1080.

Balance Sheet: Cash is down by $1080. But we have $2000 of new Assets, so the Assets side is up by $920. On the other side, Liabilities is up by $800 and Shareholders' Equity is up by $120 due to the increased Net Income, so both sides are up by $920 and balance.

2. What if Shareholders' Equity is negative?

Nothing is different. You still wipe it out, allocate the purchase price, and create Goodwill.

3. How would an accretion / dilution model be different for a private seller?

The mechanics are the same, but the transaction structure is more likely to be an Asset Purchase or 338(h)(10) Election; private sellers also don't have Earnings Per Share so you would only project down to Net Income on the seller's Income Statement.

Note that accretion / dilution makes no sense if you have a private *buyer* because private companies do not have Earnings Per Share.

4. Explain what a contribution analysis is and why we might look at it in a merger model.

A contribution analysis compares how much Revenue, EBITDA, Pre-Tax Income, Cash, and possibly other items the buyer and seller are "contributing" to estimate what the ownership of the combined company should be.

Example: Let's say that the buyer is set to own 50% of the new company and that the seller will own 50%. But the buyer has $100 million of revenue and the seller has $50 million of revenue – a contribution analysis would tell us that the buyer "should" own 66% instead because it's contributing 2/3 of the combined revenue.

It's most common to look at this with **merger of equals** scenarios, and less common when the buyer is significantly larger than the seller.

5. How would I calculate "break-even synergies" in an M&A deal and what does the number mean?

To do this, you would set the EPS accretion / dilution to $0.00 and then back-solve in Excel to get the required synergies to make the deal neutral to EPS.

It's important because you want an idea of whether or not a deal "works" mathematically, and a high number for the break-even synergies tells you that you're going to need **a lot** of cost savings or revenue synergies to make it work.

6. Normally in an accretion / dilution model you care most about combining both companies' Income Statements and Balance Sheets. But let's say I want to combine all 3 financial statements – how would I do this?

1. Always combine the buyer's and seller's Balance Sheets first (remember to wipe out the seller's Shareholders' Equity).
2. Make the necessary Pro-Forma Adjustments (cash, debt, stock, goodwill/intangibles, etc.).
3. Project the combined Balance Sheet using standard assumptions for each item (see the Accounting section of the guide).
4. Combine and project the Income Statement.
5. Then, project the Cash Flow Statement and link everything together as you normally would with any other 3-statement model. You can usually just add items together here, but you may eliminate some of the seller's investing or financing activities depending on what the buyer wants to do.

You never combine the Income Statement or Cash Flow Statement from *before* the acquisition closes. You only look at the combined statements immediately **after** the acquisition and into future years.

7. How do you handle options, convertible debt, and other dilutive securities in a merger model?

The exact treatment depends on the terms of the Purchase Agreement – the buyer might *assume* them or it might allow the seller to "cash them out" if the per-share purchase price is above the exercise prices of these dilutive securities.

If you assume that they're exercised, then you calculate dilution to the Equity Purchase Price in the same way you normally would – the Treasury Stock Method for options, and the "if converted" method for convertibles.

8. Can you explain what "Pro Forma" numbers are in a merger model?

This gets confusing because there are contradictory definitions. The simplest one is that Pro Forma numbers **exclude certain non-cash acquisition effects:**

- Amortization of Newly Created Intangibles
- Depreciation of PP&E Write-Up
- Deferred Revenue Write-Down
- Amortization of Financing Fees

Some people include all of these, other people include only some of these, and companies themselves report numbers in different ways. Excluding Amortization of Intangibles is the most common adjustment here.

While a lot of companies report numbers this way, the concept itself is flawed and inconsistent because companies themselves **already** include existing non-cash charges like Depreciation, Amortization, and Stock-Based Compensation. To make things even more confusing, some people will also add back some or all of those items as well.

9. If you're looking at a reverse merger (i.e. a private company acquires a public company), how would the merger model be different?

Mechanically, it's similar because you still allocate purchase price, combine and adjust the Balance Sheets, and combine the Income Statements, including acquisition effects.

The difference is that accretion / dilution is not meaningful if it's a private company because it doesn't have an EPS number; so you would place more weight on a contribution analysis, or even on something like the IRR of the acquisition.