IB Interview Guide, Module 4: Three-Statement Projections and More Advanced Accounting

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Overview & Key Rules of Thumb

This guide contains a mix of accounting-related topics that don't fit into the other technical guides.

These topics are all **more advanced** and, therefore, less likely to come up in interviews.

You're more likely to get these types of questions if you've had significant experience in investment banking or other finance roles, or you're in a region where a certain topic is important.

For example, in many continental European countries, bankers like to test your knowledge of **consolidation accounting** – how a parent company records the acquisition of a majority or minority stake in a subsidiary – so the section on Noncontrolling Interests and Equity Investments is more important there.

On the other hand, the section on LIFO vs. FIFO for COGS is irrelevant in Europe because only firms that follow U.S. GAAP can choose between these methods.

All these topics are less important than the core subjects: Basic Accounting, Equity Value and Enterprise Value, Valuation and DCF Analysis, and Merger Models and LBO Models.

That said, we did want to explain these topics and provide interview questions and answers in case you have more experience.

Key Rule #1: Projecting the Three Financial Statements

In many modeling tests and case studies, you'll receive requests to "project the financial statements" for a company.

For example, a banker might give you a company's Income Statement, Balance Sheet, and Cash Flow Statement for the past 3 years and say, "Please project this company's statements over the next 5 years."

You then have to make reasonable assumptions for the company's revenue growth, margins, taxes, and cash flow to create these projections.

Do **NOT** get lost in the weeds with this exercise.

The purpose of creating a "3-statement projection model" for a company is to estimate its Cash Flow, Cash, and Debt balances over the years.

Repeat after me: CASH FLOW IS KING.

Too often, people obsess over small details that don't make a difference: Should you link Accounts Receivable to Revenue? Or should you project it based on Days Sales Outstanding?

Should you make Depreciation a percentage of CapEx? Or Revenue? Or create a schedule?

Should you project each Working Capital item separately, or group the entire section together?

Here's the answer to everything: **It doesn't matter what you do as long as you get the company's CASH FLOW directionally correct.**

For example, if the company has grown its Cash Flow in each historical year, and its revenue is expected to grow at 10-15%, with its margins staying the same, then its Cash Flow *should* grow in the future as well.

On the other hand, if the company has had negative Cash Flow despite solid growth and margins, then it will probably continue to lose Cash in the future.

If the case study provides specific instructions, you should follow them. If they want projections for individual Working Capital items, make them. If they want a Depreciation Schedule, build it.

But in my experience, most people waste A TON of time and mental energy by worrying about irrelevant items in these projections.

Before we walk through the process step-by-step, I'll make one other important point: **You don't necessarily *need* to create 3-statement projections when analyzing a company.**

Why?

Because you could just project the company's revenue, expenses, and cash flow items, and determine the company's Cash, Debt, and Equity balances like that!

We use the same approach throughout all the courses and guides on the site: In simpler DCF, M&A, and LBO models, we often project the company's "Cash Flow" and skip full projections.

Full Balance Sheet projections are **unnecessary** because a company's Cash, Debt, and Equity balances change based on its Cash Flow Statement – and you can project **everything** on its Cash Flow Statement independently!

Also, you don't even need a *full* Cash Flow Statement because many items on it are non-recurring (e.g., most of the Cash Flow from Financing section). You could away with projecting just Cash Flow from Operations and CapEx and leave it at that.

There are a few exceptions in certain industries, such as commercial banks and life insurance, but we're describing the "standard" industries here (e.g., technology, industrials, healthcare, consumer/retail, power/utilities, etc.).

So, before you spend time projecting the 3 financial statements, verify that you need to do it.

Step 1: Project Revenue in a Reasonable Level of Detail

There are dozens of industries and dozens of ways to project a company's revenue.

The "best" method depends on:

1) The company's **industry**.
2) How much **data** you have.
3) How much **time** you have.
4) The **purpose** and **intended audience** of the analysis.

Broadly speaking, you can project revenue in 3 main ways:

1) A simple percentage growth rate.
2) # Units Sold * Average Price per Unit.
3) Market Share * Market Size.

If you're pressed for time, and you have limited data, you'll often use the first method.

For example, if you're completing a 30-minute case study, and the instructions tell you that the company's revenue should grow at 10% per year, use that number.

On the other hand, if you have more time – 60 minutes up to several hours or days – you will almost always use methods #2 or #3.

These more complex methods won't necessarily give you different numbers, **but they will make your numbers easier to justify.**

For example, if you're presenting your work to an MD, he/she could easily grill you if he/she sees a random 8% revenue growth rate assumption in your model.

But if you can explain it by saying, "The company's unit sales are expected to grow by 5% based on the 3 new sales reps it's hiring, and its prices are increasing by 3%; those changes result in an 8% growth rate," then the MD will be *far* less likely to question you.

Here are a few examples of how you might project revenue for companies at different maturity stages in different industries:

Example #1: High-Growth Recruiting/Headhunting Firm (Frank Recruitment)

Here, we link the company's revenue ("Turnover" in U.K. terminology) to the number of sales reps and the sales per sales rep ("Sales Rep Productivity"):

		Historical			Projected				
Financial Statement Drivers:	***Units:***	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Income Statement Drivers:									
Sales Reps:	*# People*	192	271	417	626	876	1,138	1,423	1,708
% Growth:	*%*		41.1%	53.9%	50.0%	40.0%	30.0%	25.0%	20.0%
Sales Rep Productivity:	*£ M*	0.205	0.231	0.228	0.235	0.242	0.246	0.251	0.256
% Growth:	*%*		12.3%	(1.2%)	3.0%	3.0%	2.0%	2.0%	2.0%

		Historical			Projected				
Consolidated Profit and Loss Account:	***Units:***	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Turnover:	*£ M*	**£ 39.4**	**£ 62.5**	**£ 95.0**	**£ 146.7**	**£ 211.6**	**£ 280.6**	**£ 357.8**	**£ 437.9**
% Growth Rate:	*%*	*N/A*	*58.6%*	*52.0%*	*54.5%*	*44.2%*	*32.6%*	*27.5%*	*22.4%*

Example #2: Mature Airline Company (Avianca)

An airline operates a certain number of flights, which are represented by its "Available Seat Kilometers" (ASK) or "Available Seat Miles" (ASM).

But it never sells 100% of the seats on all its flights – so you have to multiply the total number of *Available* Seat Kilometers or Seat Miles by the "Load Factor" to determine how many ASK or ASM it *earns revenue on*.

Then, you assume that each mile or kilometer flown generates a certain amount of revenue based on the average ticket price passengers have paid.

For example, if the average ticket from New York to London costs $500, and it's about 5,500 km between the cities, that's a "Yield" of $0.091 per Revenue Seat Kilometer.

You then aggregate this number over all the passengers and flights, or use simple averages:

Revenue Assumptions:	Units:	Projected 3Q 16	4Q 16	1Q 17	2Q 17	3Q 17	4Q 17	1Q 18	2Q 18	3Q 18	4Q 18
Passenger Revenue Assumptions:											
Available Seat Kilometers (ASK):	*Millions*	11,734	11,682	12,194	12,212	12,556	12,558	12,987	12,944	13,497	13,562
ASK YoY Growth Rate:	*%*	1.0%	1.0%	6.0%	5.5%	7.0%	7.5%	6.5%	6.0%	7.5%	8.0%
Passenger Load Factor:	*%*	81.3%	79.6%	78.7%	78.3%	81.3%	79.6%	78.7%	78.3%	81.3%	79.6%
Revenue Seat Kilometers (RSK):	*Millions*	9,540	9,301	9,600	9,565	10,207	9,998	10,224	10,139	10,973	10,798
RSK YoY Growth Rate:	*%*	*1.0%*	*0.9%*	*6.0%*	*5.8%*	*7.0%*	*7.5%*	*6.5%*	*6.0%*	*7.5%*	*8.0%*
Passenger Revenue:	*$ M*	787.0	767.3	816.0	813.0	918.7	899.9	945.7	937.9	1,042.4	1,025.8
Yield (Revenue / RSK):	*$ as Stated*	$ 0.0825	$ 0.0825	$ 0.0850	$ 0.0850	$ 0.0900	$ 0.0900	$ 0.0925	$ 0.0925	$ 0.0950	$ 0.0950

Example #3: Expansion-Stage Retailer (Michael Hill)

For a retailer, revenue is based on the number of stores times the average revenue per store, or the number of square feet or square meters times the sales per square foot or square meter.

You could make these projections granular and look at individual stores, or you could go higher-level and divide the company into several different regions, as we do for Michael Hill:

Revenue and Expenses:	Units:	FY17	FY18	FY19	FY20	Projected FY21	FY22
# of Stores and Sales per Store:							
Revenue by Segment:							
Australia:	*$ M AUD*	$ 320.3	$ 335.8	$ 349.9	$ 362.4	$ 374.4	$ 385.6
New Zealand:	*$ M NZD*	127.1	132.1	136.1	140.2	145.8	151.5
Canada:	*$ M CAD*	112.5	131.4	152.8	181.0	210.1	241.6
USA:	*$ M USD*	15.5	24.4	42.6	62.3	83.3	115.5
Emma & Roe:	*$ M AUD*	17.0	26.6	40.0	54.8	70.7	90.7
Number of Retail Stores:							
Australia:	*# Stores*	171	174	175	176	176	176
New Zealand:	*# Stores*	53	53	53	53	54	54
Canada:	*# Stores*	75	80	90	100	110	120
USA:	*# Stores*	10	20	30	40	50	70
Emma & Roe:	*# Stores*	25	35	50	60	75	90
Total Stores, Fiscal Year End:	*# Stores*	**334**	**362**	**398**	**429**	**465**	**510**
Sales per Store:							
Australia:	*$ M AUD*	1.89	1.95	2.00	2.07	2.13	2.19
New Zealand:	*$ M NZD*	2.42	2.49	2.57	2.64	2.72	2.81
Canada:	*$ M CAD*	1.59	1.70	1.80	1.91	2.00	2.10
USA:	*$ M USD*	1.55	1.63	1.70	1.78	1.85	1.92
Emma & Roe:	*$ M AUD*	0.83	0.89	0.94	1.00	1.05	1.10

Example #4: Mature Technology Company (Dell)

Large, mature companies operate in so many markets that it is often difficult to determine the number of units sold and the average unit price.

If your company is one of a few players in a large market (e.g., a $50 billion market where 3 companies each have 20-30% market share), it's often better to project revenue based on market share and market size.

Here's an example for Dell:

Income Statement - Segment-Level Revenue Scenarios										
	Historical				Projected					
FY Ending February 1,	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Revenue by Product:										
Servers and Networking:	$ 6,032	$ 7,609	$ 8,336	$ 9,294	$ 9,517	$ 9,993	$ 10,193	$ 10,589	$ 10,694	
Storage:	2,192	2,295	1,943	1,699	1,750	1,802	1,839	1,875	1,913	
Services:	5,622	7,673	8,322	8,396	9,179	9,592	10,024	10,425	10,842	
Software & Peripherals:	9,499	10,261	10,222	9,257	9,627	10,012	10,313	10,622	10,888	
Mobility:	16,610	18,971	19,104	15,303	13,909	14,048	13,334	13,401	12,612	
Desktop PCs:	12,947	14,685	14,144	12,991	12,801	12,865	12,329	12,267	11,675	
Total Revenue:	**52,902**	**61,494**	**62,071**	**56,940**	**56,783**	**58,313**	**58,031**	**59,179**	**58,625**	
Selected Case:	Base									
Total Market Size by Product Segment:										
Servers and Networking:	$ 49,851	$ 52,840	$ 55,573	$ 54,351	$ 55,981	$ 57,101	$ 58,243	$ 58,825	$ 59,414	
Mobility:	136,920	162,145	160,538	151,515	154,545	56,091	156,871	157,655	157,655	
Desktop PCs:	98,198	107,582	104,770	105,618	106,674	07,207	107,207	106,671	106,138	
Growth in Total Market Size by Product Segment:										
Servers and Networking:		6.0%	5.2%	(2.2%)	3.0%	2.0%	2.0%	1.0%	1.0%	
Mobility:		18.4%	(1.0%)	(5.6%)	2.0%	1.0%	0.5%	0.5%	0.0%	
Desktop PCs:		9.6%	(2.6%)	0.8%	1.0%	0.5%	0.0%	(0.5%)	(0.5%)	
Market Share by Product:							Base Case:			
Servers and Networking:	12.1%	14.4%	15.0%	17.1%	**17.0%**	**17.5%**	**17.5%**	**18.0%**	**18.0%**	
Market Share Cases - Servers and Networking:										
Conservative Case:					16.0%	15.0%	15.0%	14.0%	14.0%	
Base Case:					17.0%	17.5%	17.5%	18.0%	18.0%	
Upside Case:					17.5%	18.0%	18.0%	18.5%	18.5%	
Street Consensus Case:					16.0%	15.5%	15.5%	15.0%	15.0%	
Selected Case:	Base				**17.0%**	**17.5%**	**17.5%**	**18.0%**	**18.0%**	

The Bottom Line: There is no "best" way to project revenue. It depends on the company, its markets, and the time and resources available to you.

Regardless of the method you use, you must be able to **justify** your assumptions – even if it's a time-pressured case study where you're in a rush to finish.

Step 2: Project Expenses and/or Margins

Once you've projected the company's revenue, you need to project its expenses: Cost of Goods Sold (COGS) and Operating Expenses such as Selling, General & Administrative (SG&A), Research & Development (R&D), and Sales & Marketing (S&M).

You often project these items in *less* detail than the company's revenue.

For example, if the company's operating margin has risen from 10% to 11% historically, you might continue that trend and make it rise to 12% over the next few years.

In more complex models, you could link these expenses to individual employees, units sold, factories, or other assumptions.

As with the revenue projections, the best approach depends on your time, your data, the industry, and the purpose of the analysis.

Here's a simple example of expense projections for Frank Recruitment:

		Historical			Projected				
Financial Statement Drivers:	***Units:***	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Income Statement Drivers:									
Sales Reps:	*# People*	192	271	417	626	876	1,138	1,423	1,708
% Growth:	%		41.1%	53.9%	50.0%	40.0%	30.0%	25.0%	20.0%
Sales Rep Productivity:	*£ M*	0.205	0.231	0.228	0.235	0.242	0.246	0.251	0.256
% Growth:	%		12.3%	(1.2%)	3.0%	3.0%	2.0%	2.0%	2.0%
Other Staff:	*# People*	53	66	88	131	175	216	256	290
Other Staff % Sales Reps:	%	27.6%	24.4%	21.1%	21.0%	20.0%	19.0%	18.0%	17.0%
Net Fee Income % Margin:	%	51.3%	47.9%	48.4%	48.0%	47.0%	46.0%	45.0%	44.0%
Average Payroll Costs per Person:	*£ M*	0.041	0.049	0.051	0.053	0.056	0.058	0.061	0.063
% Growth:	%		19.2%	4.3%	5.0%	5.0%	4.0%	4.0%	4.0%
Other SG&A:	*£ M*	4.9	5.2	5.6	5.9	6.3	6.6	6.9	7.1
% Growth:	%		6.1%	7.7%	6.0%	5.5%	5.0%	4.5%	4.0%
U.K. Corporate Tax Rate:	%				20.0%	19.0%	19.0%	19.0%	18.0%

		Historical			Projected				
Consolidated Profit and Loss Account:	***Units:***	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Turnover:	*£ M*	**£ 39.4**	**£ 62.5**	**£ 95.0**	**£ 146.7**	**£ 211.6**	**£ 280.6**	**£ 357.8**	**£ 437.9**
% Growth Rate:	%	*N/A*	*58.6%*	*52.0%*	*54.5%*	*44.2%*	*32.6%*	*27.5%*	*22.4%*
Net Fee Income (NFI):	*£ M*	**20.2**	**30.0**	**46.0**	=+H203*H135		**129.1**	**161.0**	**192.7**

Company's Gross Profit is based on a simple percentage of Revenue ("Turnover").

Financial Statement Drivers:	Units:	Historical FY13	FY14	FY15	Projected FY16	FY17	FY18	FY19	FY20
Income Statement Drivers:									
Sales Reps:	# People	192	271	417	626	876	1,138	1,423	1,708
% Growth:	%		41.1%	53.9%	50.0%	40.0%	30.0%	25.0%	20.0%
Sales Rep Productivity:	£ M	0.205	0.231	0.228	0.235	0.242	0.246	0.251	0.256
% Growth:	%		12.3%	(1.2%)	3.0%	3.0%	2.0%	2.0%	2.0%
Other Staff:	# People	53	66	88	131	175	216	256	290
Other Staff % Sales Reps:	%	27.6%	24.4%	21.1%	21.0%	20.0%	19.0%	18.0%	17.0%
Net Fee Income % Margin:	%	51.3%	47.9%	48.4%	48.0%	47.0%	46.0%	45.0%	44.0%
Average Payroll Costs per Person:	£ M	0.041	0.049	0.051	0.053	0.056	0.058	0.061	0.063
% Growth:	%		19.2%	4.3%	5.0%	5.0%	4.0%	4.0%	4.0%
Other SG&A:	£ M	4.9	5.2	5.6	5.9	6.3	6.6	6.9	7.1
% Growth:	%		6.1%	7.7%	6.0%	5.5%	5.0%	4.5%	4.0%
U.K. Corporate Tax Rate:	%				20.0%	19.0%	19.0%	19.0%	18.0%

Consolidated Profit and Loss Account:	Units:	Historical FY13	FY14	FY15	Projected FY16	FY17	FY18	FY19	FY20
Turnover:	£ M	£ 39.4	£ 62.5	£ 95.0	£ 146.7	£ 211.6	£ 280.6	£ 357.8	£ 437.9
% Growth Rate:	%	*N/A*	*58.6%*	*52.0%*	*54.5%*	*44.2%*	*32.6%*	*27.5%*	*22.4%*
Net Fee Income (NFI):	£ M	20.2	30.0	46.0	70.4	99.5	129.1	161.0	192.7
Operating Expenses:									
(+) Payroll Costs:	£ M	10.0	16.4	25.6	=+H137*(H132+H126)		78.8	101.6	125.7
(+) Other SG&A:	£ M	4.9	5.2	5.6	5.9	6.3	6.6	6.9	7.1
Total Operating Expenses:	£ M	14.9	21.6	31.2	46.3	65.0	85.4	108.5	132.9

We link Payroll Costs to the total # of staff, which is, in turn, linked to Total Revenue. And then we assume an Average Payroll Cost per Staff Member.

Other G&A is based on a percentage growth rate, since it relates to expenses like advertising, marketing, accounting, IT, etc. that don't necessarily move in-line with the number of employees.

The rest of the expenses come from separate schedules or simple percentages:

Cash Flow Statement Drivers:									
Capital Expenditures % Turnover:	£ M	0.9%	1.2%	0.7%	1.0%	1.2%	1.4%	1.6%	1.8%
Depreciation % Turnover:	%	0.5%	0.6%	0.6%	0.8%	1.0%	1.2%	1.4%	1.6%
Purchases of Intangible Assets:	£ M				5.0	5.0	10.0	10.0	15.0
Amortisation of Existing Intangibles:					10.0%				
Amortisation of NEW Intangible Assets:	%				20.0%				
Amortisation - Existing Intangibles:	£ M				2.3	2.3	2.3	2.3	2.3
Amortisation - Year 1 Purchases:	£ M				0.5	1.0	1.0	1.0	1.0
Amortisation - Year 2 Purchases:	£ M					0.5	1.0	1.0	1.0
Amortisation - Year 3 Purchases:	£ M						1.0	2.0	2.0
Amortisation - Year 4 Purchases:	£ M							1.0	2.0
Amortisation - Year 5 Purchases:	£ M								1.5
Total Amortisation:	£ M				2.8	3.8	5.3	7.3	9.8

Consolidated Profit and Loss Account:	Units:	Historical FY13	FY14	FY15	Projected FY16	FY17	FY18	FY19	FY20
Turnover:	£ M	£ 39.4	£ 62.5	£ 95.0	£ 146.7	£ 211.6	£ 280.6	£ 357.8	£ 437.9
% Growth Rate:	%	*N/A*	*58.6%*	*52.0%*	*54.5%*	*44.2%*	*32.6%*	*27.5%*	*22.4%*
Net Fee Income (NFI):	£ M	20.2	30.0	46.0	70.4	99.5	129.1	161.0	192.7
Operating Expenses:									
(+) Payroll Costs:	£ M	10.0	16.4	25.6	40.3	58.8	78.8	101.6	125.7
(+) Other SG&A:	£ M	4.9	5.2	5.6	5.9	6.3	6.6	6.9	7.1
Total Operating Expenses:	£ M	14.9	21.6	31.2	46.3	65.0	85.4	108.5	132.9
EBITDA:	£ M	5.3	8.4	14.8	24.2	34.4	43.7	52.5	59.8
(-) Depreciation & Amortisation:	£ M	(0.7)	(2.0)	(1.9)	=-H186*H203-H198		(8.7)	(12.3)	(16.8)
(-) Interest Expense:	£ M	(1.2)	(3.1)	(3.4)	(2.1)	(2.2)	(2.2)	(2.3)	(2.3)
(+) Interest and Other Income:	£ M	0.0	0.0	-	0.2	0.3	0.6	1.0	1.6
(-) Provision For Income Taxes:	£ M	(0.6)	(1.2)	(2.8)	(3.6)	(5.1)	(6.3)	(7.4)	(7.6)
Profit for the Year:	£ M	£ 2.8	£ 2.1	£ 6.7	£ 14.6	£ 21.5	£ 27.0	£ 31.5	£ 34.6

Depreciation is a simple percentage of Revenue, while Amortization is based on a simple schedule that tracks existing vs. new intangibles.

We track the company's Debt and Cash balances separately and multiply by the appropriate interest rates to calculate these; you typically link them in as the final step in a model.

To calculate Income Taxes, we subtract D&A and the Net Interest Expense from EBITDA and multiply by the U.K. corporate tax rate (which ranged from 18-20% at the time of this case study).

We show the Interest Expense and Interest Income in the screenshot above, but typically you would **NOT** be able to project them at this stage of the model.

You have to forecast the company's Cash and Debt balances first, which means you have to project the Balance Sheet and/or Cash Flow Statement.

Step 3: Project the Operational Balance Sheet Items and Link Them to the CFS

"Operational Balance Sheet Items" refers to ones such as Accounts Receivable, Inventory, Prepaid Expenses, Deferred Revenue, and Accounts Payable.

These items relate **directly** to the company's core business of making and selling products to customers, and they trend with the company's Income Statement line items.

Typically, you link revenue-related items to the company's Revenue (or "Turnover" in U.K. terminology).

For example, you'll often make Accounts Receivable (AR) and Deferred Revenue (DR) percentages of Revenue based on historical trends.

If AR as a percentage of Revenue has increased from 10% to 12% in the past 3 years, you might continue that trend and make it increase to 15% over the next 5 years.

But you also have to consider the company's business model: Is there a *specific reason* why these items should be changing?

If the company is switching to subscriptions, with a large portion paid upfront, then it's reasonable that Deferred Revenue as a percentage of Revenue will increase over time.

But if the company's business model is not changing, then these percentages should not change dramatically.

You usually link items related to expenses, such as Accounts Payable, Accrued Expenses, and Other Liabilities to Operating Expenses, COGS, or specific expenses on the Income Statement.

For example, if Accrued Expenses represented 5% of Operating Expenses 3 years ago and rose to 6% last year, you might make it increase to 7% or 8% over the next few years.

But if jumped from 5.0% to 6.5% to 4.3%, you might use an average of those percentages since it's not following a clear trend.

Do NOT obsess over the specific Income Statement line item(s) you link these operational Balance Sheet items to – it barely makes a difference.

We've received approximately 52,471 questions to the effect of: "Help! I can't decide whether to link Accrued Expenses to Total Operating Expenses or SG&A. I'm going to die if I can't figure this out. Help me!!!!!!!! I'm dying!!!!"

IT DOESN'T MATTER.

Think about **the big picture:** How will that decision affect the company's **CASH FLOW?**

You just want to ensure that the company's Change in Working Capital follows a reasonable trend as its Revenue increases or decreases.

For example, if the Change in Working Capital has been negative as Revenue has increased, it should continue to be negative going forward because the company needs to spend in advance of its growth (e.g., a retailer purchasing Inventory).

As long as you get that **overall trend** correct, the specifics do not matter much.

Here's what we did for Frank Recruitment:

Balance Sheet Drivers:									
Receivables % Turnover:	%	13.4%	19.5%	13.2%	13.0%	12.5%	12.0%	11.5%	11.0%
Prepaid Expenses % OpEx:	%	13.6%	18.1%	11.9%	12.0%	12.0%	11.0%	11.0%	10.0%
Accounts Payable % OpEx:	%	4.9%	3.2%	4.4%	4.2%	4.2%	4.2%	4.2%	4.2%
Accrued Expenses % OpEx:	%	12.8%	24.5%	20.0%	20.0%	20.0%	19.0%	19.0%	18.0%
Other Current Liabilities % OpEx:	%	15.8%	10.4%	8.4%	8.0%	8.0%	7.0%	7.0%	7.0%

Continuing these trends and making the Receivables % Turnover and Prepaid Expenses, Accrued Expenses, and Other Liabilities % OpEx decrease slightly over time.

But Prepaid Expenses % OpEx doesn't follow as much of a trend, so we use a simple historical average for it.

And then we multiplied these percentages by the corresponding Income Statement items to project these line items on the Balance Sheet:

Statement of Financial Position:	Units:	Historical			Projected				
		FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
ASSETS:									
Current Assets:									
Cash & Equivalents:	£ M	£ 2.8	£ 2.4	£ 12.1					
Accounts Receivable:	£ M	5.3	12.2	12.5	19.1	26.5	33.7	41.1	48.2
Prepaid Expenses:	£ M	2.0	3.9	3.7	5.6	7.8	9.4	11.9	13.3
Total Current Assets:	£ M	**10.1**	**18.5**	**28.4**	**24.6**	**34.3**	**43.1**	**53.1**	**61.5**
Non-Current Assets:									
Net PP&E:	£ M	0.5	0.9	0.9					
Other Intangible Assets:	£ M	26.2	24.6	23.3					
Total Non-Current Assets:	£ M	**26.7**	**25.4**	**24.1**	-	-	-	-	-
Total Assets:	£ M	**£ 36.8**	**£ 43.9**	**£ 52.5**					
LIABILITIES AND EQUITY:									
Current Liabilities:									
Accounts Payable:	£ M	£ 0.7	£ 0.7	£ 1.4	£ 1.9	£ 2.7	£ 3.5	£ 4.5	£ 5.5
Accrued Expenses:	£ M	1.9	5.3	6.3	9.3	13.0	16.2	20.6	23.9
Other Current Liabilities:	£ M	2.3	2.2	2.6	3.7	5.2	6.0	7.6	9.3
Total Current Liabilities:	£ M	**5.0**	**8.2**	**10.3**	**14.9**	**20.9**	**25.7**	**32.7**	**38.7**
Non-Current Liabilities:									
Long-Term Debt:	£ M	32.8	34.6	34.0					
Other Long-Term Liabilities:	£ M	0.1	0.0	0.0					
Total Non-Current Liabilities:	£ M	**32.9**	**34.6**	**34.0**	-	-	-	-	-
Total Liabilities:	£ M	**£ 37.9**	**£ 42.8**	**£ 44.2**					
Equity Shareholders' Funds:	£ M	**-£ 1.1**	**£ 1.1**	**£ 8.3**					
Total Liabilities & Equity:	£ M	**£ 36.8**	**£ 43.9**	**£ 52.5**					
Balance Check:		*OK!*	*OK!*	*OK!*					

Finally, we linked these Balance Sheet items to the Cash Flow Statement by subtracting New Assets from Old Assets and subtracting Old Liabilities from New Liabilities:

Cash Flow Statement:	Units:	Historical			Projected				
		FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
CASH FLOWS FROM OPERATING ACTIVITIES:									
Profit for the Year:	£ M								
Adjustments for Non-Cash Charges:									
(+) Depreciation:	£ M								
(+) Amortisation:	£ M								
(+) PIK Interest:	£ M								
Changes in Operating Assets and Liabilities:									
Accounts Receivable:	£ M				(6.5)	(7.4)	(7.2)	(7.5)	(7.0)
Prepaid Expenses:	£ M				(1.8)	(2.3)	(1.6)	(2.5)	(1.4)
Accounts Payable:	£ M				0.5	0.8	0.8	1.0	1.0
Accrued Expenses:	£ M				3.0	3.8	3.2	4.4	3.3
Other Liabilities:	£ M				1.0	1.5	0.8	1.6	1.7
Net Cash Flow from Operations:	£ M				**(3.8)**	**(3.6)**	**(4.0)**	**(3.1)**	**(2.4)**

The linking process is simple. The main problem here is that we don't have a great way of CHECKING these forecasts against historical numbers since we don't have historical numbers. *Ideally*, we want to see that historically, the company's Change in Working Capital has been a small negative percentage of its Change in Revenue so that these projections make sense.

Here, the Change in Working Capital ("Changes in Operating Assets and Liabilities") is about (7%) to (3%) of the company's Change in Revenue each year.

If we had historical data, we'd want to see those numbers in the historical data as well.

If the historical Change in WC as a % of the Change in Revenue ranged from (25%) to (20%) or from 30% to 40%, we'd have to rethink these assumptions.

Step 4: Project the Remaining Cash Flow Statement Line Items

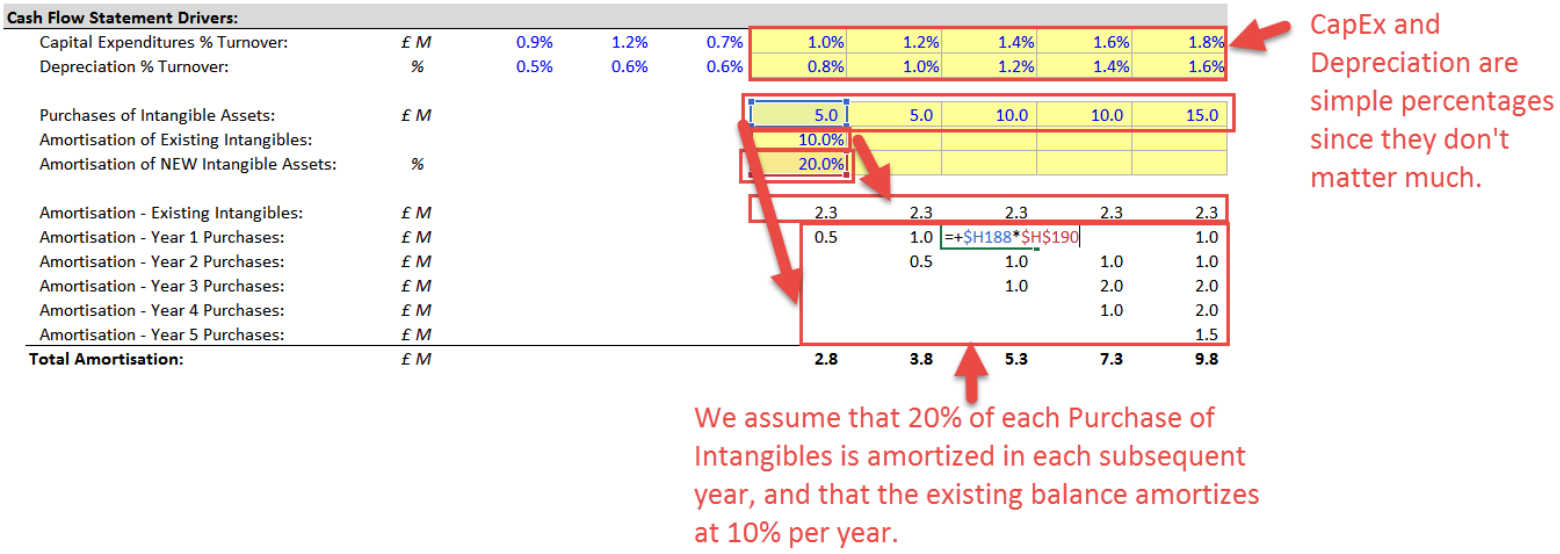
Once you've projected the *operational* Balance Sheet line items and linked the changes to the Cash Flow Statement, you forecast the remaining Cash Flow Statement line items.

Some of these items may be based on simple percentages, while others may come from separate schedules, depending on the time available and the company's industry.

For example, if you're projecting an airline, manufacturer, or railroad company, **Capital Expenditures (CapEx)** are important, and it's worthwhile to create a separate schedule for them.

But if you're modeling a software company, CapEx is almost irrelevant because software companies grow based on employee productivity, not capital asset productivity.

Often, the **Amortization of Intangible Assets** is more important for these companies. We used fairly simple assumptions for Frank Recruitment:



We also created a separate Debt schedule because we assumed that the investors used a modest amount of Debt (Term Loans A and B and a "Shareholder Loan") to acquire the company.

The Term Loans had modest amortization and variable interest rates linked to LIBOR, while the Shareholder Loan had no amortization and a fixed 10% interest rate:

Debt and Cash Drivers:	Amount:	Interest:	Principal:	PIK?					
Facility 'A' Bank Loan:	10.2	L + 350	10.0%	No					
Facility 'B' Bank Loan:	23.8	L + 400	–	No					
Shareholder Loan (PIK):	5.0	10.0%	–	Yes					
Cash:	12.1	L + 50							
LIBOR:	%				1.0%	1.2%	1.2%	1.4%	1.5%
Facility 'A' Bank Loan - Interest:	%				4.5%	4.7%	4.7%	4.9%	5.0%
Facility 'B' Bank Loan - Interest:	%				5.0%	5.2%	5.2%	5.4%	5.5%
Shareholder Loan (PIK) - Interest:	%				10.0%	10.0%	10.0%	10.0%	10.0%
Cash - Interest:	%				1.5%	1.7%	1.7%	1.9%	2.0%
Facility 'A' Bank Loan - Beginning:	£ M				10.2	9.2	8.1	7.1	6.1
(-) Amortisation:	£ M				(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
Facility 'A' Bank Loan - Ending:	£ M				**9.2**	**8.1**	**7.1**	**6.1**	**5.1**
Facility 'A' Bank Loan - Interest:	£ M				0.5	0.4	0.4	0.3	0.3
Facility 'B' Bank Loan - Beginning:	£ M				23.8	23.8	23.8	23.8	23.8
(-) Amortisation:	£ M				-	-	-	-	-
Facility 'B' Bank Loan - Ending:	£ M				**23.8**	**23.8**	**23.8**	**23.8**	**23.8**
Facility 'B' Bank Loan - Interest:	£ M				1.2	1.2	1.2	1.3	1.3
Shareholder Loan - Beginning:	£ M				5.0	5.5	6.1	6.7	7.3
(-) Amortisation:	£ M				-	-	-	-	-
(+) PIK Interest:	£ M				0.5	0.6	0.6	0.7	0.7
Shareholder Loan - Ending:	£ M				**5.5**	**6.1**	**6.7**	**7.3**	**8.1**
Cash - Interest Income:	£ M				0.2	0.3	0.6	1.0	1.6

Based on the interest rates above and the Debt balance each year.

Based on the fixed 10% rate; increases each year since PIK Interest accrues to the loan principal.

Comes from the interest rate above and the company's Cash balance each year.

These are the only supporting schedules in this model, so we can move to the Cash Flow Statement and flesh out everything there.

You always start the Cash Flow Statement projections by linking to Net Income (or "Profit After Taxes") from the Income Statement.

Then, you record the non-cash adjustments – Depreciation, Amortization, and PIK Interest in this case – and the Changes in Working Capital, which we completed in the previous step.

Here's our Cash Flow Statement for the company:

Cash Flow Statement:	Units:	Historical FY13	FY14	FY15	Projected FY16	FY17	FY18	FY19	FY20
CASH FLOWS FROM OPERATING ACTIVITIES:									
Profit for the Year:	£ M				£ 14.6	£ 21.5	£ 27.0	£ 31.5	£ 34.6
Adjustments for Non-Cash Charges:									
(+) Depreciation:	£ M				1.2	2.1	3.4	5.0	7.0
(+) Amortisation:	£ M				2.8	3.8	5.3	7.3	9.8
(+) PIK Interest:	£ M				0.5	0.6	0.6	0.7	0.7
Changes in Operating Assets and Liabilities:									
Accounts Receivable:	£ M				(6.5)	(7.4)	(7.2)	(7.5)	(7.0)
Prepaid Expenses:	£ M				(1.8)	(2.3)	(1.6)	(2.5)	(1.4)
Accounts Payable:	£ M				0.5	0.8	0.8	1.0	1.0
Accrued Expenses:	£ M				3.0	3.8	3.2	4.4	3.3
Other Liabilities:	£ M				1.1	1.5	0.8	1.6	1.7
Net Cash Flow from Operations:	£ M				**15.3**	**24.4**	**32.4**	**41.5**	**49.8**
CASH FLOWS FROM INVESTING ACTIVITIES:									
(-) CapEx:	£ M				(1.5)	(2.5)	(3.9)	(5.7)	(7.9)
(-) Purchases of Intangibles:	£ M				(5.0)	(5.0)	(10.0)	(10.0)	(15.0)
Net Cash Flow from Investing:	£ M				**(6.5)**	**(7.5)**	**(13.9)**	**(15.7)**	**(22.9)**
CASH FLOWS FROM FINANCING ACTIVITIES:									
(-) Debt Repayments:	£ M				(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
Net Cash Flow from Financing:	£ M				**(1.0)**	**(1.0)**	**(1.0)**	**(1.0)**	**(1.0)**
Change in Cash:	£ M				7.8	15.9	17.4	24.7	25.9
Beginning Cash:	£ M				12.1	20.0	35.9	53.3	78.0
Ending Cash:	£ M				£ 20.0	£ 35.9	£ 53.3	£ 78.0	£ 103.9

From the IS.

From the schedules above; all non-cash charges on the IS.

Schedules above.

The main takeaway is that this company **generates A LOT of extra Cash over the years.**

An analyst or investor looking at this Cash Flow Statement might ask, "What is the company planning to *do* with all that Cash? What *should* it be doing?"

Step 5: Link the Interest on the IS and Everything on the BS

Finally, you return to the Income Statement and link in the Interest:

Consolidated Profit and Loss Account:	Units:	Historical FY13	FY14	FY15	Projected FY16	FY17	FY18	FY19	FY20
Turnover:	£ M	£ 39.4	£ 62.5	£ 95.0	£ 146.7	£ 211.6	£ 280.6	£ 357.8	£ 437.9
% Growth Rate:	%	*N/A*	*58.6%*	*52.0%*	*54.5%*	*44.2%*	*32.6%*	*27.5%*	*22.4%*
Net Fee Income (NFI):	£ M	20.2	30.0	46.0	70.4	99.5	129.1	161.0	192.7
Operating Expenses:									
(+) Payroll Costs:	£ M	10.0	16.4	25.6	40.3	58.8	78.8	101.6	125.7
(+) Other SG&A:	£ M	4.9	5.2	5.6	5.9	6.3	6.6	6.9	7.1
Total Operating Expenses:	£ M	**14.9**	**21.6**	**31.2**	**46.3**	**65.0**	**85.4**	**108.5**	**132.9**
EBITDA:	£ M	**5.3**	**8.4**	**14.8**	**24.2**	**34.4**	**43.7**	**52.5**	**59.8**
(-) Depreciation & Amortisation:	£ M	(0.7)	(2.0)	(1.9)	(4.0)	(5.9)	(8.7)	(12.3)	(16.8)
(-) Interest Expense:	£ M	(1.2)	(3.1)	(3.4)	(2.1)	(2.2)	(2.2)	(2.3)	(2.3)
(+) Interest and Other Income:	£ M	0.0	0.0	-	0.2	0.3	0.6	1.0	1.6
(-) Provision For Income Taxes:	£ M	(0.6)	(1.2)	(2.8)	(3.6)	(5.1)	(6.3)	(7.4)	(7.6)
Profit for the Year:	£ M	£ 2.8	£ 2.1	£ 6.7	£ 14.6	£ 21.5	£ 27.0	£ 31.5	£ 34.6

Go back to the Income Statement LAST and link in the Interest Expense and Interest Income from the other schedules.

You complete this step last because Interest depends on the company's Cash and Debt, and you need the Cash Flow Statement (and possibly a Debt Schedule) to project those balances.

Here's the final Balance Sheet for the company:

Statement of Financial Position:	Units:	Historical			Projected				
		FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
ASSETS:									
Current Assets:									
Cash & Equivalents:	£ M	£ 2.8	£ 2.4	£ 12.1	£ 20.0	£ 35.9	£ 53.3	£ 78.0	£ 103.9
Accounts Receivable:	£ M	5.3	12.2	12.5	19.1	26.5	33.7	41.1	48.2
Prepaid Expenses:	£ M	2.0	3.9	3.7	5.6	7.8	9.4	11.9	13.3
Total Current Assets:	£ M	**10.1**	**18.5**	**28.4**	**44.6**	**70.1**	**96.3**	**131.1**	**165.4**
Non-Current Assets:									
Net PP&E:	£ M	0.5	0.9	0.9	1.2	1.6	2.1	2.9	3.7
Other Intangible Assets:	£ M	26.2	24.6	23.3	25.4	26.6	31.3	34.0	39.1
Total Non-Current Assets:	£ M	**26.7**	**25.4**	**24.1**	**26.6**	**28.2**	**33.4**	**36.8**	**42.9**
Total Assets:	£ M	**£ 36.8**	**£ 43.9**	**£ 52.5**	**£ 71.2**	**£ 98.3**	**£ 129.8**	**£ 167.9**	**£ 208.2**
LIABILITIES AND EQUITY:									
Current Liabilities:									
Accounts Payable:	£ M	£ 0.7	£ 0.7	£ 1.4	£ 1.9	£ 2.7	£ 3.5	£ 4.5	£ 5.5
Accrued Expenses:	£ M	1.9	5.3	6.3	9.3	13.0	16.2	20.6	23.9
Other Current Liabilities:	£ M	2.3	2.2	2.6	3.7	5.2	6.0	7.6	9.3
Total Current Liabilities:	£ M	**5.0**	**8.2**	**10.3**	**14.9**	**20.9**	**25.7**	**32.7**	**38.7**
Non-Current Liabilities:									
Long-Term Debt:	£ M	32.8	34.6	34.0	32.9	31.9	30.9	29.9	28.9
Other Long-Term Liabilities:	£ M	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Non-Current Liabilities:	£ M	**32.9**	**34.6**	**34.0**	**33.0**	**32.0**	**30.9**	**29.9**	**28.9**
Total Liabilities:	£ M	**£ 37.9**	**£ 42.8**	**£ 44.2**	**£ 47.8**	**£ 52.9**	**£ 56.7**	**£ 62.6**	**£ 67.6**
Equity Shareholders' Funds:	£ M	**-£ 1.1**	**£ 1.1**	**£ 8.3**	**£ 23.4**	**£ 45.4**	**£ 73.1**	**£ 105.3**	**£ 140.6**
Total Liabilities & Equity:	£ M	**£ 36.8**	**£ 43.9**	**£ 52.5**	**£ 71.2**	**£ 98.3**	**£ 129.8**	**£ 167.9**	**£ 208.2**
Balance Check:		*OK!*	*OK!*	*OK!*	*OK!*	*OK!*	*OK!*	*OK!*	*OK!*

From the bottom of the CFS.

Old PP&E - Depreciation + CapEx.

Old Intangibles - Amortization + Purchases.

Old Debt - Repayments + New Issuances (if they exist).

Held constant at 0 here.

Old Equity + Net Income + Shareholder Loan Interest - Dividends (if they exist).

If you don't know how to link an item, **make it flow into Equity**.

Every item on the CFS must be linked to *something* on the Balance Sheet once and only once, so you can't "leave out" an item if you don't know where it goes.

If you do, the Balance Sheet will go out of balance.

The other rules covered in the Accounting guides apply to this process as well: On the Assets side, use negative signs when you link to items from the CFS, and on the L&E side, use positive signs when you link to items from the CFS.

One final note: In the example above, we added the PIK Interest on the CFS to Equity on the Balance Sheet.

But that is NOT the normal treatment. Instead, for most normal Debt, you should add the PIK Interest on the CFS to the corresponding Debt line item on the Balance Sheet.

It's different here because this Debt is a "Shareholder Loan," which is classified as Equity and which lets the equity investors in the company deduct the interest paid each year.

Step 6: Create Summary Statistics

It's nice to build a complex, 3-statement model with 5,234 rows in Excel, but **senior people do not have time to read every last detail.**

To save them time and make your conclusions more concise, you may create a "model summary" at the end.

The information presented in this summary depends on the purpose of the model. A few examples:

- **Credit Analysis:** If you're assessing a company's ability to repay Debt, you might focus on credit statistics and ratios, such as Debt / EBITDA, EBITDA / Interest, and the Debt Service Coverage Ratio.

- **Equity Investment Analysis:** If you're analyzing a potential equity investment in a company, you'll focus on metrics such as the internal rate of return (IRR) and money-on-money (MoM) multiples.

- **Valuation:** You might focus on the company's revenue, EBITDA, cash flow, growth rates, and margins.

- **M&A Analysis:** You might focus on the company's growth rates, EPS, and other per-share metrics so you can assess how those metrics change in a deal.

The Frank Recruitment case study was based on a potential equity investment in the company, but we decided to show a mix of the metrics above:

Summary & Returns:	Units:	Historical FY13	FY14	FY15	Projected FY16	FY17	FY18	FY19	FY20
Financial Statistics and Credit Stats and Ratios:									
Turnover:	£ M	£ 39.4	£ 62.5	£ 95.0	£ 146.7	£ 211.6	£ 280.6	£ 357.8	£ 437.9
Growth Rate:	%	*N/A*	*58.6%*	*52.0%*	*54.5%*	*44.2%*	*32.6%*	*27.5%*	*22.4%*
EBITDA:	£ M	5.3	8.4	14.8	24.2	34.4	43.7	52.5	59.8
Growth Rate:	%	*N/A*	*57.7%*	*76.8%*	*63.7%*	*42.3%*	*27.0%*	*20.2%*	*13.9%*
Margin:	%	*13.5%*	*13.4%*	*15.6%*	*16.5%*	*16.3%*	*15.6%*	*14.7%*	*13.7%*
Interest Expense:	£ M	1.2	3.1	3.4	2.1	2.2	2.2	2.3	2.3
Cash Interest Expense:	£ M	1.2	3.1	3.4	1.6	1.7	1.6	1.6	1.6
Total Debt:	£ M	32.8	34.6	34.0	32.9	31.9	30.9	29.9	28.9
Net Debt:	£ M	30.0	32.2	21.8	13.0	(4.0)	(22.4)	(48.1)	(75.0)
EBITDA / Interest:	x	4.5 x	2.7 x	4.4 x	11.3 x	15.5 x	19.6 x	22.9 x	25.5 x
EBITDA / Cash Interest:	x	4.5 x	2.7 x	4.4 x	14.7 x	20.6 x	27.0 x	32.2 x	37.1 x
Total Debt / EBITDA:	x	6.2 x	4.1 x	2.3 x	1.4 x	0.9 x	0.7 x	0.6 x	0.5 x
Net Debt / EBITDA:	x	5.7 x	3.8 x	1.5 x	0.5 x	(0.1 x)	(0.5 x)	(0.9 x)	(1.3 x)
Money-on-Money (MoM) Multiples and Internal Rate of Return (IRR):									
Exit Year EBITDA:	£ M						43.7	52.5	59.8
(x) Assumed Exit Multiple:	x						10.0 x	9.0 x	8.0 x
Exit Enterprise Value:	£ M						**436.8**	**472.7**	**478.5**
(-) Net Debt:	£ M						22.4	48.1	75.0
Exit Equity Value:	£ M						**459.2**	**520.8**	**553.5**
Investor Proceeds:	x						114.8	130.2	138.4
MoM Multiple:	x						3.8 x	4.3 x	4.6 x
Internal Rate of Return (IRR):	%						56.4%	44.3%	35.8%

Strong revenue growth, but it slows down over time.

Margins don't change dramatically.

And the company can easily "service" its Debt (i.e., pay Interest on it and repay the principal eventually).

These IRR and MoM metrics are extremely high, so an investment in the company *seems* like a good idea... if we believe the assumptions!

The next steps depend on a few factors.

First, what is the **purpose** of the model? If we built this projection model to answer a case study or complete a modeling test, then we're done.

But if we built it to analyze a real, potential investment, we'd go **into the numbers in more depth at this stage.**

For example, we might dig into the revenue growth and margin assumptions, see if we can come up with more detailed rationale, and find data from the industry and peer companies to support our assumptions.

If there aren't enough qualified sales reps for the company to grow at this pace, we might have to re-think that assumption.

If there's no way for the company to maintain its margins because no peer companies have done so as they've grown, we might have to re-think that assumption.

We would also **stress test** the model and create Downside scenarios to see how well the deal holds up in those cases.

For example, if the company's revenue growth falls to 10-15% in Year 1 and then declines to 5%, do we lose money on the deal? Or do we still earn at least a 1.0x multiple?

We might also think about the company's Cash Flow and the extra Cash it generates.

In this case, it's significant: Cash goes from £12 million GBP to over £100 million in the span of 5 years.

If the company isn't doing anything with that Cash, investors might view that as a wasted opportunity and encourage the company to return the Cash to shareholders, make acquisitions, or re-invest in the business.

Most of these "next steps" are more important in **buy-side roles** – ones where you're investing the firm's capital – because far more is at stake there.

In investment banking roles, you care the most about finishing the model, making sure the client likes it, and then moving on.

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Key Rule #2: LIFO vs. FIFO for Inventory (U.S. Only)

NOTE: This section is only relevant if you're in the U.S. because the accounting methods described here are not available in most other countries.

In the earlier accounting lessons and guides, we assumed that a decrease in Inventory always corresponded to an increase in COGS.

For example, if a company had previously purchased $100 of widgets, and then it sold those widgets for $200, we recorded $200 in revenue and $100 in COGS and reduced Inventory by $100.

For simple examples over short time frames, that assumption is fine.

But over longer time frames, that method creates problems because the price of the Inventory may change.

For example, maybe this company has ordered 100 units of Inventory over a year. Initially, each unit cost $10, but by the end of the year, the price had increased to $20 each.

If the company records the sale of 10 units, what should it record for COGS: 10 * $20, or 10 * $10?

If the company records 10 * $10, it's called **FIFO (First In, First Out)**, and if it records 10 * $20, it's called **LIFO (Last In, First Out)**.

With FIFO, the company reflects what it *originally* cost to purchase these units; with LIFO, the company reflects the *current price* of these units.

Under IFRS, **only FIFO is allowed.**

But under U.S. GAAP, companies can use LIFO, FIFO, or an "average" method that blends them.

Each method has advantages and disadvantages and affects Net Income, Inventory, COGS, and Cash Flow differently.

Here's a simple example of what might happen if a company has ordered 40 Inventory units over a year, and the unit costs have increased from $10 to $20 in that time:

Assumptions:

Assumptions:	
Tax Rate:	40%
Product Units Sold During the Year:	40
Per-Unit Product Selling Price:	$ 30

LIFO

Inventory Purchases:	Units:	Unit Cost:	Value:
Beginning Inventory:	10	$ 10	$ 100
Q1 Units Ordered:	10	12	120
Q2 Units Ordered:	10	15	150
Q3 Units Ordered:	10	17	170
Q4 Units Ordered:	10	20	200
Total:	**50**		**$ 740**

Assumptions:

Assumptions:	
Tax Rate:	40%
Product Units Sold During the Year:	40
Per-Unit Product Selling Price:	$ 30

FIFO

Inventory Purchases:	Units:	Unit Cost:	Value:
Beginning Inventory:	10	$ 10	$ 100
Q1 Units Ordered:	10	12	120
Q2 Units Ordered:	10	15	150
Q3 Units Ordered:	10	17	170
Q4 Units Ordered:	10	20	200
Total:	**50**		**$ 740**

Under LIFO, we record $120 + $150 + $170 + $200 = $640 for Cost of Goods Sold (COGS).

Under FIFO, we record $100 + $120 + $150 + $170 = $540 for Cost of Goods Sold (COGS).

Income Statement:

	LIFO:	FIFO:	Average:
Revenue:	**$ 1,200**	**$ 1,200**	**$ 1,200**
Cost of Goods Sold (COGS):	640	540	590
Gross Profit:	**560**	**660**	**610**
Operating Expenses:	460	460	460
Operating Income:	**100**	**200**	**150**
Net Interest Income:	-	-	-
Pre-Tax Income:	**100**	**200**	**150**
Income Tax Provision:	40	80	60
Net Income:	**$ 60**	**$ 120**	**$ 90**

COGS is higher under LIFO and lower under FIFO.

That means that Pre-Tax Income and Net Income are lower under LIFO and higher under FIFO.

…But remember that these relationships hold **only** if Inventory costs have been *increasing* over time.

On the Balance Sheet, we always record the same number for Inventory Purchases ($640), so the Inventory line item increases by the same amount.

But this Inventory line item *decreases* based on COGS, so the Ending Inventory balance differs depending on the method used:

Balance Sheet - Change in Inventory:			
	LIFO:	FIFO:	Average:
(+) Beginning Inventory:	$ 100	$ 100	$ 100
(+) Purchases:	640	640	640
(-) Cost of Goods Sold (COGS):	(640)	(540)	(590)
Ending Inventory:	**$ 100**	**$ 200**	**$ 150**

Under LIFO, the Ending Inventory balance stays the same, but under FIFO, the Ending Inventory balance is higher.

Cash flow will be higher under LIFO because the "Change in Inventory" on the CFS will be $0, and Net Income is $60 with the assumptions above.

Under FIFO, the "Change in Inventory" will be negative $100, and Net Income will be $120 rather than $60.

As a result, Cash Flow under LIFO will be higher by $40.

If we assumed falling Inventory costs instead, everything would reverse: Cash Flow would be higher under FIFO, and Net Income and the ending Inventory would be higher under LIFO.

The Significance of LIFO vs. FIFO in Financial Models

If you're comparing companies in the same industry, and some companies use LIFO, while others use FIFO, you might have to adjust the financial statements.

A company using FIFO doesn't necessarily have "higher margins" – it might just be recording lower COGS than a company using LIFO because Inventory costs have been increasing.

But most companies don't disclose enough information to make these adjustments; you'll rarely see disclosures for units sold and average unit prices in public filings.

So, you might have to make much rougher adjustments and apply an industry average or median to determine companies' true gross margins.

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Key Rule #3: Operating Leases vs. Capital Leases

NOTE: Under both IFRS and U.S. GAAP, the distinction between operating leases and capital leases is going away. All, or most, leases will be shown on the Balance Sheet in the future.

It's still good to know the difference, but as a result of this convergence, we will keep this section short.

Just as a company can record the cost of Inventory in different ways, it can also lease equipment and buildings in different ways.

The main options are **operating leases** and **capital leases**, also known as **finance leases**.

With **operating leases**, the company does not own the building or equipment it is leasing: It rents it, and when the term is up, the equipment or building goes back to the owner.

The main expense – Rent – shows up on the company's Income Statement as an Operating Expense during the lease term.

Nothing shows up on the Balance Sheet even if the company has signed a 5-year or 10-year agreement with fixed Rent each year.

You should see the problem with that: A contract that requires the company to pay a fixed amount for 2, 3, 5, or 10 years *should* be considered a Liability on the Balance Sheet.

Some companies use **capital leases** instead: The leased buildings or equipment show up as Assets on the Balance Sheet, the leases show up as Debt on the Liabilities & Equity side of the BS, and there are Depreciation and Interest rather than Rent on the Income Statement.

These capital leases may also have principal repayments on the Cash Flow Statement.

A capital lease is similar to a company purchasing equipment or buildings with Debt and then paying off that Debt over time.

The trade-offs of operating leases vs. capital leases are the same as the trade-offs of renting vs. buying a home: It's usually cheaper to rent, but you lose out on the possibility of capital gains.

So, if a company wants to spend less and reduce the risk of owning obsolete equipment or buildings in the future, it might use operating leases.

But if the company wants that ownership option, it's more likely to use capital leases.

Here's how these lease types compare on the Income Statement:

Income Statement	Operating Leases:	Capital Leases:	
Revenue:	**$ 1,000**	**$ 1,000**	
Cost of Goods Sold (COGS):	200	200	
Gross Profit:	**800**	**800**	
Operating Expenses:	400	400	
Rental Expense:	10	-	<--- Not always true, but *generally* Rent exceeds Depreciation for an operating lease vs. capital lease scenario.
Depreciation:	-	6	
Operating Income:	**390**	**394**	<--- ...which pushes down OpInc for the operating lease company.
Net Interest Expense:	-	6	
Pre-Tax Income:	**390**	**388**	<--- Pre-Tax Income is closer, but lower for the CapLease company because of interest.
Income Tax Provision:	156	155	
Net Income:	**$ 234**	**$ 233**	<--- Net Income is similar here, but it's typically a fair bit lower for CapLease company.
EBITDA:	**$ 390**	**$ 400**	
EBITDAR:	**$ 400**	**$ 400**	

You use EBITDAR to compare companies with different types of leases; by adding back Rent, you remove the impact of leases.

As shown above, you can compare companies using different lease types by using metrics such as EBITDAR that add back the Rental Expense.

EBITDAR excludes Depreciation, Interest, AND Rent, so the lease types are irrelevant.

You could also "convert" operating leases into capital leases by calculating the Present Value of an operating lease's future payments (with a discount rate linked to the interest rate on a similar Debt issuance).

But no one does that in real life. The most common approach is to multiply the annual lease payments by **7x** or **8x** to capitalize the lease.

Here's an example for Avianca:

Key Metrics and Ratios:	Units:	Historical 1Q 14	2Q 14	3Q 14	4Q 14	1Q 15	2Q 15	3Q 15
Credit Stats and Ratios:								
LTM EBITDA:	$ M				479.2	501.4	457.9	459.3
LTM EBITDAR:	$ M				778.1	809.5	779.5	785.2
LTM Interest Expense:	$ M				133.9	150.1	156.2	164.5
LTM Net Interest Expense:	$ M				116.8	130.2	135.0	143.7
LTM Rental Expense:	$ M				298.9	308.0	321.6	325.9
LTM Debt Service + Rental Expense:	$ M				503.6	536.1	554.5	567.5
Op. Leases to Capitalized Leases Conversion:	x	7.0 x						
Value of Capitalized Operating Leases:	$ M				2,092.1	=+I153*E156		2,281.4
Total Debt + Capitalized Operating Leases:	$ M				5,262.7	5,371.0	5,576.0	5,620.0
Net Debt + Capitalized Operating Leases:	$ M				4,579.0	4,658.6	4,818.3	4,963.8
Total Capital:	$ M				6,471.4	6,633.7	6,869.7	7,287.1
Net Capital:	$ M				5,787.7	5,921.3	6,112.0	6,630.9

We capitalize the operating leases at 7x annual rent and add them to the company's Total Debt and Net Debt (the existing Capital Leases should already be within the Debt balance).

Whenever we use a ratio that uses EBITDAR, we must include the value of the Capitalized Operating Leases in that ratio as well.

For example, instead of using Enterprise Value in the EV / EBITDA multiple, we have to use (Enterprise Value + Capitalized Operating Leases) / EBITDAR.

For metrics like Debt / EBITDA and EBITDA / Interest, we must add the Capitalized Operating Leases to Debt and add Rent to the Interest Expense if we use EBITDAR rather than EBITDA:

Key Metrics and Ratios:	Units:	Historical 1Q 14	2Q 14	3Q 14	4Q 14	1Q 15	2Q 15	3Q 15	4Q 15	1Q 16	2Q 16
Total Debt / EBITDA:	x				6.6 x	6.4 x	7.3 x	7.3 x	7.9 x	7.4 x	6.7 x
(Total Debt + Capitalized Leases) / EBITDAR:	x				6.8 x	6.6 x	7.2 x	7.2 x	7.5 x	7.3 x	6.8 x
Net Debt / EBITDA:	x				5.2 x	5.0 x	5.6 x	5.8 x	6.7 x	6.4 x	5.9 x
(Net Debt + Capitalized Leases) / EBITDAR:	x				5.9 x	5.8 x	6.2 x	6.3 x	6.8 x	6.6 x	6.3 x
EBITDA / Interest Expense:	x				3.6 x	3.3 x	2.9 x	2.8 x	2.6 x	2.6 x	2.7 x
EBITDA / Net Interest Expense:	x				4.1 x	3.9 x	3.4 x	3.2 x	2.9 x	2.9 x	3.0 x
EBITDAR / (Net Interest Expense + Rent):	x				1.9 x	1.8 x	1.7 x	1.7 x	1.6 x	1.6 x	1.7 x
EBITDAR / (Total Debt Service + Rent):	x				1.5 x	1.5 x	1.4 x	1.4 x	1.3 x	1.4 x	1.4 x

When you use EBITDAR in metrics and ratios, both the numerator and denominator must reflect the impact of capitalizing the operating leases, which means adding them directly or *adding back* the Rental Expense.

This business with "converting" leases will soon be less relevant because both IFRS and U.S. GAAP are moving to eliminate the off-Balance Sheet treatment of leases.

HOWEVER, you still need to know about operating leases because companies under both systems can still use operating lease treatment for short-term (< 12-month) leases.

Also, not all companies will convert their leases overnight; especially in countries that follow local GAAP rather than IFRS or U.S. GAAP, operating vs. capital leases will persist.

Here's a summary of the differences on the financial statements:

	Operating Leases:	Capital Leases:	
Assets:	Lower	Higher	<--- Must list the assets on the Balance Sheet for capital leases.
Liabilities:	Lower	Higher	<--- Must record debt for the capital leases - equal to the PV of future payments.
Operating Income:	Lower	Higher	<--- Generally, Rental Expense > Depreciation By Itself.
Net Income (Early Years):	Higher	Lower	<--- Generally, Depr. + Int. Expense > Rental Expense.
Net Income (Later):	???	???	<--- Depends on how the interest expense changes over time!
Cash Flow from Operations	Lower	Higher	<--- Depreciation add-back with capital leases, which boosts CFO.
Cash Flow from Financing:	Higher	Lower	<--- No debt repayments with operating leases!
Total Cash Flow:	Similar?	Similar?	<--- Tough to say and changes over time, but often the Net Change in Cash comes out to a similar figure regardless of the lease type.

And here's how various key metrics and ratios might be affected:

Current Ratio = Current Assets / Current Liabilities
Working Capital = Current Assets - Current Liabilities
Operating Working Capital = Current Assets Excl. Cash and Investments - Current Liabilities Excl. Debt
Asset Turnover Ratio = Revenue / Average Total Assets
ROA = Net Income / Average Total Assets
ROE = Net Income / Average Shareholders' Equity
ROIC = NOPAT / Average Debt + Equity + Debt-Like Items

	Operating Leases:	Capital Leases:	
Current Ratio:	Higher	Lower	<--- Because some capital leases may be "Current" Liabilities, but the assets won't be Current.
Working Capital:	Higher	Lower	<--- Because some capital leases may be "Current" Liabilities, but the assets won't be Current.
Operating Working Capital:	Same	Same	<--- Excluding cash and debt, so capital leases make no impact!
Asset Turnover Ratio:	Higher	Lower	<--- Revenue stays the same, but Assets are higher under capital leases.
ROA:	Higher	Lower	<--- Net Income is lower under capital leases, and Assets are higher.
ROE:	Higher	Lower	<--- Net Income is lower under capital leases, and Shareholders' Equity is... the same?
ROIC:	Higher?	Lower?	<--- NOPAT should be higher under capital leases since Depreciation < Rent, but Invested Capital will also be higher... so could go either way, but "higher" is a good guess.
Debt to Equity Ratio:	Lower	Higher	<--- More debt on the Balance Sheet with capital leases...

The **valuation impact** is tough to determine.

With capital leases, or with capitalized operating leases, you assume no lease-related expenses in the Free Cash Flow projections, so FCF would be higher.

But at the end of the analysis, you have to subtract the capitalized leases when moving from Implied Enterprise Value to Implied Equity Value.

If you used operating lease treatment instead, FCF would be lower because of the Rental Expense, but you wouldn't subtract the leases when calculating Implied Equity Value at the end.

Often, there isn't much of a difference unless the leases have unusual terms, such as extremely high rent or interest.

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Key Rule #4: Trading vs. AFS vs. HTM Securities

Just like there are different ways to account for leases and Inventory purchases, there are also different ways to account for a company's **investments**.

Even though investing in stocks, bonds, real estate, and other assets is not a part of most companies' core businesses, they often do it when they have extra Cash and want to do something with it.

For example, if a company only needs $100 in Cash for its operations, but it has accumulated $250, it may take the extra $150 and start buying stocks and bonds with it.

When that happens, the company must make a few decisions about how to treat these investments:

- **Decision #1:** At what value should it list the investments on its Balance Sheet? Should it use historical cost (i.e., what the company originally paid for the investments)? Or should it list the investments' current market value?

- **Decision #2:** If the company sells the investments, how should it record the *Realized* Gains and Losses from that sale? For example, if the company buys shares in another company for $10.00 each and sells them for $15.00 each, where does that show up?

- **Decision #3:** What about Dividends and Interest from these investments? Are they taxable? Do they appear on the Income Statement or just the Cash Flow Statement?

- **Decision #4:** What about *Unrealized* Gains and Losses? For example, if Company A buys shares in Company B for $10.00, and Company B's share price increases to $15.00, but Company A sells nothing, what happens?

The answers to Decisions #2 and #3 are easy: You always show Dividends, Interest, and Realized Gains and Losses on the Income Statement for all types of investments.

But Decisions #1 and #4 are trickier because the answers depend on **the company's intentions.**

If the company plans to hold these investments until they mature (e.g., 10 years for a 10-year bond), the accounting treatment differs from the treatment for shorter-term investments.

And if the company plans to buy and sell these investments in the *very short term*, the treatment also differs.

Finally, if the company purchases a **significant stake** in another company – such as 10%, 20%, or 50%+ of it – the accounting treatment also differs, but we'll explain that in the section below on Noncontrolling Interests and Equity Investments.

Here's a summary of the main accounting methods and classifications for investments: **Trading**, **Available for Sale (AFS)**, and **Held to Maturity (HTM):**

Type of Investment:	Why Use It?	Used For:	Balance Sheet:	Accounting Method:	Unrealized Gains and Losses:	Realized Gains and Losses:	Dividends and Interest Received:
Trading	Buy/sell for short-term profits	Stocks and bonds	Short-Term Investments	Fair Market Value	Income Statement	Income Statement	Income Statement
Available For Sale (AFS)	"Default" category for everything else	Stocks and bonds	Long-Term Investments	Fair Market Value	AOCI	Income Statement	Income Statement
Held-to-Maturity (HTM)	Buy and hold until it matures	Mostly bonds	Long-Term Investments	Amortized Cost	Not reported	Income Statement	Income Statement
Significant Influence	20% - 50% ownership in another company	Other companies	Equity Investments	Equity Method	N/A - All of these items have a more complex treatment.		
Control	> 50% but < 100% ownership in another company	Other companies	Noncontrolling Interests	Consolidation	N/A - All of these items have a more complex treatment.		

As with the previous topics (LIFO vs. FIFO and Operating vs. Capital Leases), this one also differs a bit between U.S. GAAP and IFRS, and it may change in the future.

Under IFRS 9, the IASB is changing the classification criteria and attempting to make it more "principle-based" and less discretionary.

However, these changes are not that important because the accounting treatment of investments is still *basically* the same: Record an investment at fair market value or

amortized cost. Then, record Unrealized Gains and Losses on the Income Statement, in Accumulated Other Comprehensive Income (AOCI) on the Balance Sheet, or not at all.

Here are a few examples:

Example #1: Company Purchases $100 of Trading Securities and Records an Unrealized Gain

If Company A purchases 100 shares in Company B for $1.00 each, and it plans to sell them for a quick Gain, it should classify the shares as Trading Securities on the Balance Sheet.

If Company B's share price then increases to $1.10, Company A must record this **Unrealized Gain** on its Income Statement.

It will also record a Realized Gain if it sells the Securities at this point, but that's true of any investment.

Here's what happens on the statements, assuming a 40% tax rate:

- **Income Statement:** Unrealized Gain of $10, so Pre-Tax Income is up by $10 and Net Income is up by $6.
- **Cash Flow Statement:** Net Income is up by $6; you subtract the $10 Unrealized Gain since it's non-cash, and Cash at the bottom is down by $4.
- **Balance Sheet:** Cash is down by $4, Short-Term Investments are up by $10, and the Assets side is up by $6. The L&E side is up by $6 due to the Retained Earnings increase.
- **Intuition:** The company paid taxes on an Unrealized Gain. Those taxes reduced its Cash balance, but it hasn't received any Cash because it hasn't sold anything yet.

Here's a visual:

Income Statement

	Current Period: Before Changes:	After Changes:
Revenue:	$ 1,300	$ 1,300
Cost of Goods Sold (COGS):	100	100
Gross Profit:	**1,200**	**1,200**
Operating Expenses:	200	200
Depreciation:	-	-
Stock-Based Compensation:	-	-
Amortization of Intangibles:	-	-
Operating Income:	**1,000**	**1,000**
(+) Interest Income:	-	-
(-) Interest Expense:	-	-
Gain / (Loss) on Sale of PP&E:	-	-
Gain / (Loss) on Sale of ST Inv.:	-	10
(-) Goodwill Impairment:	-	-
(-) PP&E Write-Down:	-	-
Pre-Tax Income:	**1,000**	**1,010**
Income Tax Provision:	400	404
Current Portion of Taxes:	400	404
Deferred Portion of Taxes:	-	-
Net Income:	**600**	**606**
(-) Preferred Dividends:	-	-
Net Income to Common:	$ 600	$ 606
Common Shares (MM):	1,000	1,000
Earnings Per Share (EPS):	$ 0.60	$ 0.61

Balance Sheet

	Beginning of Current Period:	End of Current Period: Before Changes:	After Changes:
Assets:			
Current Assets:			
Cash & Cash-Equivalents:	$ 100	$ 700	$ 696
Short-Term Investments:	100	100	110
Accounts Receivable:	100	100	100
Prepaid Expenses:	100	100	100
Inventory:	100	100	100
Total Current Assets:	**500**	**1,100**	**1,106**
Long-Term Assets:			
Plants, Property & Equipment:	1,000	1,000	1,000
Other Intangible Assets:	300	300	300
Long-Term Investments:	100	100	100
Goodwill:	100	100	100
Total Long-Term Assets:	**1,500**	**1,500**	**1,500**
Total Assets:	**$ 2,000**	**$ 2,600**	**$ 2,606**
Liabilities & Equity:			
Current Liabilities:			
Revolver (Short-Term Debt):	$ 100	$ 100	$ 100
Accounts Payable:	200	200	200
Accrued Expenses:	200	200	200
Total Current Liabilities:	**500**	**500**	**500**
Long-Term Liabilities:			
Deferred Revenue:	200	200	200
Deferred Tax Liability:	200	200	200
Long-Term Debt:	100	100	100
Total Long-Term Liabilities:	**500**	**500**	**500**
Total Liabilities:	**$ 1,000**	**$ 1,000**	**$ 1,000**
Equity:			
Shareholders' Equity:			
Common Stock & APIC:	600	600	600
Treasury Stock:	(100)	(100)	(100)
Retained Earnings:	300	900	906
Accum. Other Compr. Income:	100	100	100
Total Shareholders' Equity:	**900**	**1,500**	**1,506**
Preferred Stock:	100	100	100
Total Equity:	**$ 1,000**	**$ 1,600**	**$ 1,606**
Total Liabilities & Equity:	**$ 2,000**	**$ 2,600**	**$ 2,606**
Balance Sheet Balanced?	**OK!**	**OK!**	**OK!**

Example #2: Company Purchases $100 of AFS Securities and Records an Unrealized Gain

In this scenario, Company A still purchases 100 shares of Company B for $1.00 each, but it does not plan to sell those shares quickly.

Therefore, it lists them as "Available for Sale" (AFS) Securities on its Balance Sheet.

If Company B's share price increases to $1.10, and Company A has *not* yet sold anything, here is what happens on the statements:

- **Income Statement:** No changes.
- **Cash Flow Statement:** No changes.
- **Balance Sheet:** Long-Term Investments are up by $10, and Accumulated Other Comprehensive Income (AOCI) on the L&E side is also up by $10.

Here's what the Balance Sheet looks like:

Balance Sheet	Beginning of Current Period:	End of Current Period: Before Changes:	End of Current Period: After Changes:
Assets:			
Current Assets:			
Cash & Cash-Equivalents:	$ 100	$ 700	$ 700
Short-Term Investments:	100	100	100
Accounts Receivable:	100	100	100
Prepaid Expenses:	100	100	100
Inventory:	100	100	100
Total Current Assets:	**500**	**1,100**	**1,100**
Long-Term Assets:			
Plants, Property & Equipment:	1,000	1,000	1,000
Other Intangible Assets:	300	300	300
Long-Term Investments:	100	100	110
Goodwill:	100	100	100
Total Long-Term Assets:	**1,500**	**1,500**	**1,510**
Total Assets:	**$ 2,000**	**$ 2,600**	**$ 2,610**
Liabilities & Equity:			
Current Liabilities:			
Revolver (Short-Term Debt):	$ 100	$ 100	$ 100
Accounts Payable:	200	200	200
Accrued Expenses:	200	200	200
Total Current Liabilities:	**500**	**500**	**500**
Long-Term Liabilities:			
Deferred Revenue:	200	200	200
Deferred Tax Liability:	200	200	200
Long-Term Debt:	100	100	100
Total Long-Term Liabilities:	**500**	**500**	**500**
Total Liabilities:	**$ 1,000**	**$ 1,000**	**$ 1,000**
Equity:			
Shareholders' Equity:			
Common Stock & APIC:	600	600	600
Treasury Stock:	(100)	(100)	(100)
Retained Earnings:	300	900	900
Accum. Other Compr. Income:	100	100	110
Total Shareholders' Equity:	**900**	**1,500**	**1,510**
Preferred Stock:	100	100	100
Total Equity:	**$ 1,000**	**$ 1,600**	**$ 1,610**
Total Liabilities & Equity:	**$ 2,000**	**$ 2,600**	**$ 2,610**
Balance Sheet Balanced?	**OK!**	**OK!**	**OK!**

Example #3: Company Purchases $100 of Bonds in Another Company and Plans to Hold Them Until Maturity

In this case, Company A buys $100 of Company B's 10-year bonds and plans to hold them until the bonds mature in 10 years.

As a result, it records these bonds as "Held-to-Maturity" (HTM) Securities on the Balance Sheet.

After it does so, the fair market value of these bonds increases from $100 to $110.

That might happen if prevailing interest rates on similar bonds decline – if Company B's bonds have a coupon rate of 6%, and similar bonds now have coupon rates of 5%, investors will pay a premium for Company B's bonds.

When this happens, nothing changes. This counts as an Unrealized Gain, and you do not record Unrealized Gains on the financial statements for HTM Securities.

If Company A were to *sell* these bonds for $110, then you would record a Realized Gain of $10 on the Income Statement and make it flow through the rest of the statements.

But you always record Realized Gains and Losses on the Income Statement for all types of investments; it's the treatment of *Unrealized* Gains and Losses that differs significantly.

What Does This Topic Mean for Financial Models?

Not much. We're covering this topic **only because there's a small chance you might get interview questions on it.**

In financial models, you almost always assume nothing for Gains and Losses on Investments.

Even if the company purchases or sells investments over time, you rarely assume any changes in the fair market value of those investments.

This topic is significantly *mostly* for commercial banks and insurance firms because investing **is** a core business activity for those companies, and a significant portion of their revenue may come from Interest and Dividends.

A commercial bank or insurance firm's Book Value of Equity may be "propped up" by Unrealized Gains from AFS Securities recorded within AOCI – so if you believe those Gains will disappear, you might have to adjust down the company's Equity.

That's significant because financial firms are required to keep a certain amount of Equity on their Balance Sheets at all times; if they go below that level, they cannot issue Dividends.

But that's a separate topic covered in the industry-specific courses and guides.

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Key Rule #5: Introduction to Pension Accounting

Pension accounting is confusing, arbitrary, and **not that important in IB interviews.**

Just as you'll rarely "project" the fair market value of a company's investments, you'll also rarely "project" a company's pension plans beyond simple percentage growth rates.

Here is the short version of pensions for interview and financial modeling/case study purposes:

1. **Unfunded Pensions:** If a company has a *defined benefit plan* for employees that is unfunded or underfunded – e.g., it has promised employees $10 billion in the future, but it has only set aside $7 billion currently – then you must add this $3 billion Unfunded Pension when moving from Equity Value to Enterprise Value.

   If the company's contributions *into* the pension plan are tax-deductible, you multiply the Unfunded Pension by (1 – Company's Tax Rate); if they're not, you don't.

   You add the Unfunded Pension because it is a long-term funding source for the company and represents "another investor group" – the company's employees!

   Those employees agree to lower pay now in exchange for more benefits in the future – and the company uses that "funding" to operate.

2. **The Pension Expense in Other Metrics:** If you've added this Unfunded Pension to calculate Enterprise Value, you must also add back (or "exclude") the *financing-related components* of the Pension Expense when calculating metrics like EBIT and EBITDA… but only if those components affect the company's Operating Income!

   There are several components to the Pension Expense on the Income Statement: The "Service Cost" (the amount that accrues based on the time employees spend at the company), the Interest Expense on the Pension Liability, the *Expected* Return on Plan Assets, the Amortization of Prior Service Costs and Net Losses / (Gains), and "Other Adjustments."

   Of those, only the Service Cost is a true operating expense: The rest are financial in nature, so you **exclude them** from metrics like EBITDA.

   But companies don't always disclose the details of their Pension Expenses, so it might be tough to figure out whether or not these items affect Operating Income.

   If there are no disclosures in the footnotes, it's a decent bet that only the Service Cost has affected Operating Income – in which case you don't need to adjust anything.

3. **No Adjustments Required:** If the company does **not** have a pension plan or has only a *defined contribution plan* – where employees invest and are responsible for their own savings and retirement – then you do not have to adjust anything.

   Newer companies, such as the big technology firms, tend to use defined contribution plans for employees, while old-school industrial/manufacturing companies tend to use defined benefit plans.

We recommend keeping pensions as simple as possible because the accounting is so arbitrary.

In an Unlevered DCF, for example, you should ignore everything but the Service Costs when projecting Free Cash Flow for the company.

Then, subtract the Unfunded Pension, multiplied by (1 – Tax Rate) if necessary, as a Debt-like item when you back into the Implied Equity Value at the end.

The Easy Case: Defined Contribution Plans

If a company offers a plan where employees set aside some of their salaries, invest the funds independently, and withdraw the money in retirement, all the complexity around pensions goes away.

Most likely, the company will offer a "match" for 25%, 50%, or 100% of what the employees contribute. That match shows up as an Operating Expense on the Income Statement:

Income Statement:		
Revenue:	**$**	**700**
Cost of Goods Sold (COGS):		70
Gross Profit:		**630**
Operating Expenses:		
Sales & Marketing:		165
Research & Development:		75
General & Administrative:		50
401(k) Matching Contributions:		30
Total Operating Expenses:		**320**
Operating Income (EBIT):	**$**	**310**

This type of plan might create short-term Assets and Liabilities because of timing differences, but there will be no long-term Pension Assets or Liabilities because the employees own everything.

How Defined Benefit Pensions Are Recorded on the Balance Sheet

If a company promises *specific* payments to employees in the future based on their current salaries and years at the company, the complexity increases dramatically.

This plan is called a "Defined Benefit" Pension, and the company must record separate items on all its financial statements to account for it.

As an example of how this plan works, an employee who retires at age 65 might receive a monthly pension check of 1% * # of Years of Employment * Average Monthly Salary.

If his average monthly salary was $5,000, and he worked for 20 years, that's a monthly check of 1% * 20 * $5,000 = $1,000, or $12,000 per year.

If another year passes, and his total employment term reaches 21 years, the monthly check increases to 1% * 21 * $5,000 = $1,050, or $12,600 per year.

When a company offers a plan like this, it must set aside funds to pay for it in the future. Those funds take the form of the **Pension Plan Assets** on the Balance Sheet.

On the L&E side, the company must record a **Projected Benefit Obligation** (PBO) associated with the plan. This item represents the company's estimate for how much it will owe employees in the future.

Here's what Pepsi's plans looked like one year:

Pension Plan Assets:	Year 1	Year 2
Beginning Plan Assets:	**$ 11,293**	**$ 13,645**
Actual Return on Plan Assets:	1,523	1,500
Employer Contributions:	1,865	262
Benefit Payments:	(465)	(721)
Other Adjustments:	(571)	(41)
Ending Plan Assets:	**$ 13,645**	**$ 14,645**

Projected Benefit Liability:	Year 1	Year 2
Beginning Plan Liability:	**$ 15,845**	**$ 17,185**
Service Cost:	557	623
Interest Cost:	714	699
Experience (Gain) / Loss:	1,069	(1,715)
Benefit Payments:	(465)	(721)
Other Adjustments:	(535)	(3)
Ending Plan Liability:	**$ 17,185**	**$ 16,068**

Since the Projected Benefit Liability exceeds the Pension Plan Assets in each year, this plan is **underfunded**, and we'd have to add this deficit when calculating Enterprise Value.

The Pension Plan Assets are easier to understand, so we'll start there.

If a company sets aside money for a pension, it can boost those funds in 2 ways:

1. **Investing the funds** and earning a return on them ("Actual Return on Plan Assets").
2. **Setting aside more funds** ("Employer Contributions").

And, as you'd expect, **Benefit Payments** to employees – what the company pays to retired employees on this plan – reduce these Assets.

That logic explains the positive and negative signs for everything above.

"Other Adjustments" might consist of dozens of different items, ranging from calculation or methodology changes to taxes to legal issues to employees leaving the plan.

On the other side, the "Service Cost" represents the additional cost incurred each year from employees staying at the company longer or receiving pay increases.

Most pensions pay retired employees based on the employees' average salary at the company and years of work experience, so increases in either one result in a higher Liability.

The "Interest Cost" represents how the company moves closer to payout each year, which increases the Present Value of the PBO.

For example, if the PV of the Future Payout last year was $100, but this year it's $105, the company would record $105 – $100 = $5 for this entry.

If the Discount Rate changes, this item could also change.

"Experience (Gain) / Loss" refers to the additional costs or costs savings as a result of **actuarial estimates changing.**

For example, if the company's actuaries predict that employee salaries will rise by 5% per year rather than 4%, that would be recorded as a **Loss**, and it would increase the PBO.

"Benefit Payments" are the same item that affects the Pension Plan Assets: When a company pays retired employees, both its funds allocated to pensions and its future liabilities decrease.

Finally, "Other Adjustments," as on the Assets side, could represent almost anything: FX Rate Effects, Legal Costs, Plan Amendments, Early Terminations, and so on.

The Pension Expense on the Income Statement and Cash Flow Statement

Here's the Pension Expense on Pepsi's Income Statement for these years:

Pension Plan Assets:	Year 1	Year 2
Beginning Plan Assets:	**$ 11,293**	**$ 13,645**
Actual Return on Plan Assets:	1,523	1,500
Employer Contributions:	1,865	262
Benefit Payments:	(465)	(721)
Other Adjustments:	(571)	(41)
Ending Plan Assets:	**$ 13,645**	**$ 14,645**

Projected Benefit Liability:	Year 1	Year 2
Beginning Plan Liability:	**$ 15,845**	**$ 17,185**
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Benefit Payments:	(465)	(721)
Other Adjustments:	(535)	(3)
Ending Plan Liability:	**$ 17,185**	**$ 16,068**

Income Statement Pension Expense	Year 1	Year 2
Service Cost:	$ 557	$ 623
Interest Cost:	714	699
Expected Return on Plan Assets:	(964)	(1,007)
Amort. of Prior Service Cost/(Credit	(8)	(4)
Amort. of Net Loss / (Gain):	312	356
Other Adjustments:	203	27
Total Income Statement Expense:	**$ 814**	**$ 694**

<-- Expense accrues as employees spend more time at the company.
<-- Liability accrues as more time passes.

<-- Amortization of difference between actual vs. expected returns.
<-- Lawsuit settlements, special terminations and benefits, etc.

The Service Cost and Interest Cost flow in from the changes in the Pension Benefit Obligation on the Balance Sheet. But the rest is trickier to explain.

The "Expected Return on Plan Assets" is what it sounds like: The company estimates how much its investment strategies for the pension plan *should* return in the future.

These *anticipated returns* reduce the Pension Expense because they reduce the funding gap between the Pension Assets and Pension Liabilities.

If Pepsi had set aside $1,000 in its Pension Plan Assets and it expected a 7% annual return, it would record ($70) for the "Expected Return on Plan Assets" here.

But "expected returns" rarely match actual returns: In these years, for example, the company's actual returns were $1,523 and $1,500 vs. expected returns of $964 and $1,007.

Companies calculate the difference between actual and expected returns and amortize this difference over time.

Returns can be volatile, so companies do this to "smooth out" the Pension Expense on the Income Statement.

But this policy also creates various Amortization line items within the Pension Expense on the Income Statement, all of which are non-cash.

Companies with significant defined benefit pension plans disclose the key assumptions used to calculate these numbers in their filings:

US Pension Plan Assumptions:	Year 1	Year 2	Year 3
Liability Discount Rate:	4.6%	4.2%	5.0%
Expense Discount Rate:	5.7%	4.6%	4.2%
Expected Return on Plan Assets:	7.8%	7.8%	7.8%
Liability Rate of Salary Increases:	3.7%	3.7%	3.7%
Expense Rate of Salary Increases:	4.1%	3.7%	3.7%
Actual Return on Pension Plan Assets:		**13.5%**	**11.0%**

Quite aggressive, but not necessarily "crazy."

Fairly stable, which is a good sign for the estimates.

Even if the assumptions behind these estimates are reasonable, there is still a big problem: **The "Pension Expense" recorded on the Income Statement has almost nothing to do with the Cash the company spends on the pension.**

Here are the Cash Flow Statement entries for Pepsi's pension plan:

Pension Plan Assets:	Year 1	Year 2
Beginning Plan Assets:	**$ 11,293**	**$ 13,645**
Actual Return on Plan Assets:	1,523	1,500
Employer Contributions:	1,865	262
Benefit Payments:	(465)	(721)
Other Adjustments:	(571)	(41)
Ending Plan Assets:	**$ 13,645**	**$ 14,645**

Projected Benefit Liability:	Year 1	Year 2
Beginning Plan Liability:	**$ 15,845**	**$ 17,185**
Service Cost:	557	623
Interest Cost:	714	699
Experience (Gain) / Loss:	1,069	(1,715)
Benefit Payments:	(465)	(721)
Other Adjustments:	(535)	(3)
Ending Plan Liability:	**$ 17,185**	**$ 16,068**

Income Statement Pension Expens	Year 1	Year 2
Service Cost:	$ 557	$ 623
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Expected Return on Plan Assets:	(964)	(1,007)
Amort. of Prior Service Cost/(Cred	(8)	(4)
Amort. of Net Loss / (Gain):	312	356
Other Adjustments:	203	27
Total Income Statement Expense:	**$ 814**	**$ 694**

Cash Flow Statement Pension Iter	Year 1	Year 2
Pension Expenses:	$ 796	$ 664
Pension Contributions:	(1,865)	(262)
Net Cash Flow from Pensions:	**$ (1,069)**	**$ 402**

Company is adding back almost the entire Pension Expense from the Income Statement, since it's mostly non-cash.

And then, the company is recording its own pension contributions, which reduce cash flow.

For the most part, ONLY the company's Cash Contributions to its pension plan will affect its Cash Flow – most of the Pension Expenses on the Income Statement are non-cash.

Pepsi's plan is **Underfunded** because its Projected Benefit Liability exceeds its Pension Plan Assets.

That doesn't mean that Pepsi will go bankrupt; it just means the company will have to raise additional funding (Debt, Equity, Preferred, etc.) to cover the pension costs in the future, which is one reason why we add the Unfunded Pension when calculating Enterprise Value.

Since Pepsi is a U.S.-based company and this plan is for U.S.-based employees, the company's plan contributions are most likely tax-deductible.

So, we would multiply the Unfunded Pension ($17,185 – $13,645 in Year 1) – by (1 – Tax Rate) when adding it to Enterprise Value.

What Do Pensions Mean for Financial Modeling?

As with other advanced items, "not that much" is the best answer.

In an Unlevered DCF analysis, we recommend keeping things simple by **ignoring the pension altogether until you back into the Implied Equity Value at the end**.

At that point, you should subtract either the Unfunded Pension or Unfunded Pension * (1 – Tax Rate).

In the Unlevered FCF projections, include the Service Cost but nothing else, and *add it back* as a non-cash expense.

If you have to project the Pension Plan Assets or Pension Benefit Obligations for any reason (e.g., in a 3-statement model), **keep it simple.**

You could assume a Return on Plan Assets in-line with historical percentages, make Employer Contributions and Benefit Payments grow at fixed percentages, and link the Interest Cost to the growth rate of employee salaries.

"Other Adjustments" can be a simple percentage of the previous Pension Assets or Pension Liabilities, and you can ignore the Expected Return and Amortization line items on the Income Statement since your only concern is the Service Cost.

If you have to project these items, make them simple percentages of the Pension Assets or Pension Liabilities.

When you calculate metrics and multiples such as EV / EBITDA, the denominator must *include* the Service Cost but *exclude* everything else, and the Enterprise Value must include the appropriate Unfunded Pension value.

Unfunded Pensions should not affect the Cash Price paid by acquirers in M&A deals or leveraged buyouts because the acquirer doesn't pay anything upfront for them (unless there are highly unusual deal terms).

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Key Rule #6: Noncontrolling Interests and Equity Investments

In a previous section, we discussed the accounting treatment of **investments**: How a company records Unrealized Gains and Losses and the Balance Sheet values of investments differently depending on the *purpose and planned holding period* of those investments.

But in addition to those categories – Trading, AFS, and HTM Securities – there's another big category of investments as well: One company's *significant ownership* in another company.

For example, Company A might acquire a 25% stake in Company B, or a 49% stake, or even a 75% stake.

When Company A acquires a **significant minority stake** in Company B – above 20% but below 50% – it is called an **Equity Investment** or **Associate Company**.

When Company A acquires a **majority stake** in Company B – above 50% but below 100% – a **Noncontrolling Interest** (formerly known as a "Minority Interest") gets created.

This Noncontrolling Interest represents the portion of Company B that Company does **not** own.

Equity Investments

If Company A acquires 30% of Company B, Company A will create an "Equity Investment" line item on its Balance Sheet that represents the cost of that stake.

If it uses Cash to purchase the stake, its Cash balance will decrease, so the Balance Sheet remains in balance; if it uses Debt or Equity, Debt or Equity on the L&E side will increase.

After that initial purchase, **the financial statements are never consolidated.**

Company A simply records "Earnings from Equity Investments" at the bottom of its Income Statement, based on its ownership in Company B and Company B's Net Income.

Here's an example where Company A acquired 30% of Company B, which was worth $100:

Assumptions:

Parent Company Tax Rate:	35%
Associate Company Tax Rate:	35%
Value of Associate Company:	$ 100
Ownership in Associate:	30%
Equity Investment:	$ 30

When you own between 20% and 50% of another company, **nothing is consolidated** - the other company's Net Income * Portion You Own is simply shown as an addition to Net Income at the bottom of the Income Statement, and there is an Asset recorded on the Balance Sheet for the % you own.

<--- This is what's shown on the Balance Sheet. **NOT** marked to market! Initial price, plus adjustments over time.

Combined Company:	Year 1
Revenue:	$ 400
Costs of Goods Sold:	136
Gross Profit:	**264**
Operating Expenses:	201
Depreciation & Amortization:	20
Operating Income:	**43**
Net Interest Expense:	(15)
Pre-Tax Income:	**28**
Income Taxes:	(10)
Equity Investment Earnings:	**2**
Net Income:	**20**

Parent Company:	Year 1
Revenue:	$ 400
Costs of Goods Sold:	136
Gross Profit:	**264**
Total Operating Expenses:	201
Depreciation & Amortization:	20
Operating Income:	**43**
Net Interest Expense:	(15)
Pre-Tax Income:	**28**
Income Taxes:	(10)
Net Income:	**18**

Associate Company:	Year 1
Revenue:	$ 100
Costs of Goods Sold:	25
Gross Profit:	**75**
Total Operating Expenses:	60
Depreciation & Amortization:	5
Operating Income:	**10**
Net Interest Expense:	-
Pre-Tax Income:	**10**
Income Taxes:	(4)
Net Income:	**7**

On the Cash Flow Statement, you reverse this "Equity Investment Earnings" line item because the Parent Company does **not** receive these earnings in Cash.

So, Net Income at the top of the CFS is initially up by $2, but you record a ($2) entry for Equity Investment Earnings, and Cash does not change.

On the Balance Sheet, the Equity Investment line item on the Assets side will increase by $2 because of this adjusting entry on the CFS.

And on the L&E side, Retained Earnings will increase by $2 because Net Income at the top of the CFS was higher by $2 initially.

If this Associate Company issues Dividends, you record *only* the portion that the Parent Company receives on its Cash Flow Statement (usually under Cash Flow from Operations).

For example, if the Associate Company here issues $10 in Dividends, the Parent Company receives $3 since it owns 30% of the Associate Company.

The Parent Company records those $3 in Dividends on the CFS, which boosts cash flow by $3. On the Balance Sheet, these Dividends *reduce* the Equity Investment line item on the Assets side by $3 and boost the Cash balance by $3.

In subsequent years, this Equity Investment line item is **not** "marked to market" – it changes based on the Associate Company's Net Income and Dividends and whether or not the Parent Company sells any of its stake (or purchases an additional stake).

Even if the Parent Company purchases a 30% stake in the Associate Company when the company is worth only $100, and the company's value then skyrockets to $10,000, that huge change is **not** reflected on the Balance Sheet.

Noncontrolling Interests

When Company A acquires *more than* 50% of Company B, it must **consolidate its financial statements with those of Company B 100%.**

Even if Company A acquires only 60% or 70% of Company B, it must still add 100% of Company B's revenue, expenses, Assets, Liabilities, etc. to its own.

Company A must also create **Goodwill** and write up Assets to their fair market values, which creates a Deferred Tax Liability.

Here's what happens when a Parent Company with an existing **30% stake** in an Associate Company purchases an additional 40%, increasing its total stake to 70%:

Transaction Assumptions:

Existing Stake in Target:	30.0%	Price Paid per Target Share Acquired:	$ 40.00
Additional Stake Acquired in Target in Deal:	40.0%	Target's Shares Outstanding:	30.00
Purchase Equity Value of 100% of Target:	$ 1,200.0	Debt Issuance Fee %:	3.0%
		Acquirer's Tax Rate:	40.0%
(+) Equity Value of Existing 30.0% Stake:	360.0		
(+) Purchase Equity Value of Additional 40.0%:	480.0		
Equity Value of Total 70.0% Stake in Target:	**$ 840.0**		

Purchase Consideration:	%:	Amount:
Cash:	33.3%	$ 160.0
Debt:	33.3%	160.0
Stock:	33.3%	160.0

Sources & Uses of Funds:

Sources:	
(+) Cash Used:	$ 160.0
(+) Debt Issued:	160.0
(+) Stock Issued:	160.0
(+) Excess Cash Used for Transaction Fees:	4.8
Total Sources:	**$ 484.8**

Uses:	
(+) Purchase Equity Value of Additional 40.0%:	$ 480.0
(+) Financing Fees:	4.8
Total Uses:	**$ 484.8**

As in a normal M&A deal for 100% of a company, the Parent creates Goodwill, writes off the Associate Company's Common Book Value, writes up Assets, and creates a new Deferred Tax Liability:

Purchase Price Allocation:

Goodwill Calculation:	
Purchase Equity Value of 100% of Target:	$ 1,200.0
(-) Seller Book Value:	(777.0)
(+) Write-Off of Existing Goodwill:	1.8
Total Allocable Purchase Premium:	**424.8**
(-) Write-Up of PP&E:	(14.9)
(-) Write-Up of Intangibles:	(63.7)
(-) Write-Down of Deferred Tax Liabilities:	(11.2)
(+) New Deferred Tax Liability:	31.4
Total Goodwill Created:	**366.5**

Fixed Asset Write-Up:	
PP&E Write-Up %:	10.0%
PP&E Write-Up Amount:	$ 14.9
Intangible Asset Write-Up:	
Purchase Price to Allocate:	$ 424.8
% Allocated to Other Intangibles Assets:	15.0%
Intangibles Write-Up Amount:	$ 63.7
New Deferred Tax Liability:	$ 31.4

As always, Asset Write-Ups increase the Asset side, reducing the Goodwill we need to create; new Liabilities increase the amount of Goodwill we must create.

On the Balance Sheet, you combine all the line items of both companies, create the new Goodwill, and write down the previous Equity Investment line item:

Balance Sheet Combination:	Units	Historical Buyer	Historical Seller	Pro-Forma Adjustments: Debit	Pro-Forma Adjustments: Credit	Post-Deal
ASSETS:						
Current Assets:						
Cash & Cash Equivalents:	$M	$ 59.3	$ 445.5	$ -	$ (164.8)	$ 340.0
Accounts Receivable:	$M	63.2	13.6	-	-	76.7
Inventory:	$M	599.5	304.3	-	-	903.8
Other Current Assets:	$M	93.2	23.1	-	-	116.3
Total Current Assets:	$M	**815.1**	**786.5**			**1,436.8**
Long-Term Assets:						
Plants, Property & Equipment:	$M	408.2	149.0	14.9	-	[illegible]
Goodwill:	$M	126.0	1.8	366.5	(1.8)	492.5
Other Intangible Assets:	$M	58.0	-	63.7	-	121.7
Equity Investments:	$M	360.0	-	-	(360.0)	-
Other Assets:	$M	5.1	0.3	-	-	5.4
Total Long-Term Assets:	$M	**957.3**	**151.1**			**1,191.7**
TOTAL ASSETS:	$M	**$ 1,772.4**	**$ 937.6**			**$ 2,628.4**

Cash to purchase stake + transaction fees.

Write down seller's existing Goodwill and create new Goodwill.

The Parent now owns more than a minority stake, so we write these down.

On the Liabilities & Equity side, you reflect the new Debt and Stock used to fund the deal, write down the seller's Shareholders' Equity, and create the Noncontrolling Interest:

Balance Sheet Combination:	Units	Historical Buyer	Historical Seller	Pro-Forma Adjustments: Debit	Pro-Forma Adjustments: Credit	Post-Deal
LIABILITIES & EQUITY:						
Current Liabilities:						
Accounts Payable:	$M	$ 148.8	$ 32.9	-	-	181.7
Accrued Expenses & Other Liabilitie	$M	175.8	115.0	-	-	290.8
Income Taxes Payable:	$M	0.7	-	-	-	0.7
Total Current Liabilities:	$M	**325.3**	**148.0**			**473.3**
Long-Term Liabilities:						
Long-Term Debt:	$M	97.5	-	-	-	97.5
New Transaction Debt:	$M	-	-	(4.8)	160.0	155.2
Deferred Tax Liability:	$M	109.3	11.2	(11.2)	31.4	140.7
Other Noncurrent Liabilities:	$M	-	1.4	-	-	1.4
Total Long-Term Liabilities:	$M	**206.8**	**12.6**			**394.9**
Total Liabilities:	$M	**$ 532.1**	**$ 160.5**			**$ [illegible]**
Shareholders' Equity:	$M	$ 1,240.3	$ 777.0	(777.0)	160.0	1,400.3
Noncontrolling Interests:	$M	-	-	-	360.0	360.0
Total Equity:	$M	**$ 1,240.3**	**$ 777.0**			**$ [illegible]**
TOTAL LIABILITIES & EQUITY:	$M	**$ 1,772.4**	**$ 937.6**			**$ 2,628.4**
Balance Sheet Check:		*OK!*	*OK!*			*OK!*

Debt to fund purchase; subtract financing fees.

Write down seller's Shareholders' Equity; reflect Stock used to fund deal.

This new "Noncontrolling Interest" represents the 30% of the other company the Parent does NOT own.

One common misconception is that a Noncontrolling Interest represents the 70% of the Other Company the Parent now owns.

But that is incorrect – it represents the 30% the Parent does NOT own.

Here's how this purchase changes under different scenarios:

- **0% to 70% Stake:** Most of the steps are the same, but we no longer need to write down the Equity Investment line item because no Equity Investment will exist. Also, the Parent will have to spend more Cash, Debt, and Stock to do the deal since it's going from a 0% stake to a 70% one rather than 30% to 70%.

- **30% to 100% Stake:** No Noncontrolling Interest is created, but everything else is the same: The Parent still creates Goodwill, writes up Assets, writes down the seller's Shareholders' Equity, consolidates the statements, and writes down the existing Equity Investment.

- **0% to 100% Stake:** No NCI is created, and there is no existing Equity Investment. It's just a normal M&A deal, so Goodwill is created, Assets are written up, the seller's Shareholders' Equity is written down, and the Balance Sheets are combined and adjusted.

The mix of Cash, Stock, and Debt does **not** affect the Noncontrolling Interests, Equity Investments, or Goodwill at all.

That mix affects only the *adjustments* to the Cash, Debt, and Stock on the Balance Sheet.

The Aftermath of a Noncontrolling Interest

After the Parent Company acquires a majority stake in another company and creates a Noncontrolling Interest to reflect the portion it does *not* own, it must consolidate its financial statements 100% with those of the other company.

So, if Parent Company's revenue is $100, and Other Company's revenue is $50, the Combined Revenue is $150 – even if Parent Company owns only 60% or 80% of Other Company.

Then, at the bottom of the Income Statement, the Parent Company must subtract out "Net Income Attributable to Noncontrolling Interests" to represent the portion of the Other Company's Net Income that it is *not* entitled to:

Example for Noncontrolling Interests:

Parent Company Tax Rate:	35%
Majority-Owned Co. Tax Rate:	35%
Value of Other Company:	$ 100
Ownership in Other Company:	70%
Noncontrolling Interest:	$ 30

When you own between 50% and 100% of another company, **everything is consolidated 100%** and you add all the other company's line items to your own statements…
But you also reflect Net Income Attributable to the Other Company at the bottom of the IS, and you show a "Noncontrolling Interest" for the portion you do **NOT** own on the L&E side of the Balance Sheet.

<--- This is what's shown on the Balance Sheet. **NOT** marked to market! Initial price, plus adjustments over time.

Combined Company:	Year 1
Revenue:	$ 500
Costs of Goods Sold:	161
Gross Profit:	**339**
Operating Expenses:	261
Depreciation & Amortization:	25
Operating Income:	**53**
Net Interest Expense:	(15)
Pre-Tax Income:	**38**
Income Taxes:	(13)
Net Income:	**25**
Net Income Attributable to Noncontrolling Interests:	(2)
Net Income Attrib. to Parent:	**23**

Parent Company:	Year 1
Revenue:	$ 400
Costs of Goods Sold:	136
Gross Profit:	**264**
Total Operating Expenses:	201
Depreciation & Amortization:	20
Operating Income:	**43**
Net Interest Expense:	(15)
Pre-Tax Income:	**28**
Income Taxes:	(10)
Net Income:	**18**

Majority-Owned Company:	Year 1
Revenue:	$ 100
Costs of Goods Sold:	25
Gross Profit:	**75**
Total Operating Expenses:	60
Depreciation & Amortization:	5
Operating Income:	**10**
Net Interest Expense:	-
Pre-Tax Income:	**10**
Income Taxes:	(4)
Net Income:	**7**

Since we do **NOT** own 30% of the Other Company, we subtract $7 * 30% to determine Net Income Attributable to Parent.

On the Cash Flow Statement, Net Income at the top is down by $2.

But in reality, the Parent Company **does** receive this "Net Income Attributable to Noncontrolling Interests" in Cash since it controls the other company.

So, we reverse this item on the CFS by adding back the $2 within Cash Flow from Operations.

As a result, Cash at the bottom of the CFS stays the same.

On the Balance Sheet, Retained Earnings decreases by $2 because Net Income is down by $2, and the Noncontrolling Interest increases by $2 because of the reversal on the CFS.

The L&E side stays the same, and so does the Assets side, so the BS remains in balance.

If the Other Company issues Dividends, you still consolidate 100% of those Dividends with the Parent Company's Dividends.

For example, if the Other Company issues Dividends of $10, and the Parent issues $50 in Dividends, you record Dividends of $60 on the Cash Flow Statement.

This $60 has a negative sign and appears within Cash Flow from Financing.

HOWEVER, you must also adjust for the fact that many of the Dividends issued by the Other Company will go to the Parent!

If the Parent Company owns 70% of the Other Company, you make a positive adjusting entry on the CFS for 70% * $10 to reflect that $7 of these Dividends will go to the Parent.

If you're reflecting *just* the changes from these Dividends, Cash at the bottom of the CFS decreases by $53.

On the Balance Sheet, the Noncontrolling Interest still increases by $2 and Retained Earnings still decreases by $2 (assuming that Net Income Attributable to Noncontrolling Interests is still $2).

But then you must reflect the Dividends: They reduce Retained Earnings by $50 (because of the $50 the Parent Issued) and the Noncontrolling Interest by $3 (because of the Other Company's Dividends). Cash on the other side also decreases by $53.

So, throughout all these changes, the Balance Sheet remains in balance.

How Do Equity Investments and Noncontrolling Interests Affect Financial Models?

First, you must **subtract Equity Investments** when moving from Equity Value to Enterprise Value, and you must **add Noncontrolling Interests** when doing the same.

Equity Investments count as "non-core-business Assets," and the Revenue EBIT, EBITDA, etc. associated with them do **not** appear in the Parent Company's metrics because **the statements are not consolidated.**

If you have to project Equity Investments in a 3-statement model, **keep it simple** and use percentage growth rates to forecast Net Income and a simple payout ratio for the Dividends.

In a valuation, you might have to calculate the fair market value of the Equity Investments, especially if they represent stakes in public companies that have become significantly more valuable since the Parent first acquired the stakes.

The process is the same as valuing any other company: Pick comparable companies and apply the multiples and/or build a simple DCF. Then, multiply the Parent Company's ownership stake by the Other Company's Implied Equity Value.

You add Noncontrolling Interests in the Enterprise Value calculation because they count as **another investor group:** If the Parent Company owns a majority of another company, it can "draw on" that company's resources to fund its operations.

You also do it for comparability purposes – metrics that pair with Enterprise Value, such as Revenue, EBITDA, and EBIT, reflect 100% of the Majority-Owned Company's financials, so Enterprise Value should also reflect 100% of the Majority-Owned Company's value.

If there's a big difference between book value and fair market value, you can also value Noncontrolling Interests with comparable companies and a DCF.

Then, you can use this fair market value of the Noncontrolling Interests when moving from Equity Value to Enterprise Value.

You shouldn't put much effort into forecasting Net Income or Dividends associated with Noncontrolling Interests because **they're already part of the company's core-business operations.**

If you must forecast them in a 3-statement model, use a simple percentage growth rate for Net Income and a simple payout ratio for the Dividends.

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Key Rule #7: Net Operating Losses (NOLs)

If a company *loses* money – it records negative Pre-Tax Income – it can reduce its future taxable income with those losses or receive refunds for its past income taxes.

These losses are called **Net Operating Losses (NOLs)**, and a company that applies them to reduce its future taxes uses **carryforwards** to do so.

Carrybacks are for the second situation (receiving refunds for past taxes paid).

It is easier to explain NOL carryforwards, so we'll focus on them here.

Let's say that a company has recorded significant losses in the past, so it has a Net Operating Loss balance of $175.

That $175 figure is recorded **off-Balance Sheet**. On the company's Balance Sheet, it records approximately $175 * Tax Rate within its Deferred Tax Asset (DTA) to represent those NOLs.

So, if the company's Tax Rate is 40%, it records $175 * 40% = $70 for the NOL within its DTA.

If the company earns *positive* Pre-Tax Income, it uses up a portion of this NOL balance to reduce its Taxable Income.

If the company earns *negative* Pre-Tax Income, it *adds to* this NOL balance (both the off-Balance Sheet portion and the amount within the DTA).

Regardless of the sign of the Pre-Tax Income, the company STILL records Income Taxes based on Pre-Tax Income * Tax Rate on the Income Statement.

Here's how it works:

Tax Rate:	40%			
Beginning Net Operating Loss (NOL) Balance:	$ 175			
NOL Component within the Deferred Tax Asset (DTA):	70			
Combined Company:	**Year 1**	**Year 2**	**Year 3**	
Pre-Tax Income:	$ 100	$ (200)	$ 300	<-- These are what appear on the Income Statement.
Income Taxes:	40	(80)	120	<-- Pre-Tax Income * Tax Rate.
Beginning NOL Balance:	175	75	275	<-- The NOL Balance itself is **NOT** on the Balance Sheet! It's a separate item!
(+) NOLs Created:	-	200	-	<-- If Pre-Tax Income is negative, add to the NOL balance; otherwise add $0.
(-) NOLs Used:	(100)	-	(275)	<-- Apply either the lesser of the total remaining NOLs, or the Pre-Tax Income..
Ending NOL Balance:	**$ 75**	**$ 275**	**$ -**	...but if Pre-Tax Income is negative, just use $0 - nothing to offset.
NOL-Adjusted Pre-Tax Income:	**-**	**(200)**	**25**	Only pay Cash Taxes if NOL-Adjusted Pre-Tax Income is positive.
Annual Tax Savings:	40	-	110	
Cash Taxes Payable:	**$ -**	**$ -**	**$ 10**	
Increase / (Decrease) in DTA:	(40)	80	(110)	<-- DTA will decrease each year that we use NOLs, and will increase whenever we accumulate NOLs from taking losses.

The Change in the DTA equals (NOLs Created – NOLs Used) * Tax Rate.

If NOLs are *used*, the DTA will *decrease* to reflect their use.

If NOLs are *created*, the DTA will *increase* to reflect their accumulation.

Nothing related to NOLs ever shows up on the company's Income Statement; you only make adjustments for their use and accumulation on the Cash Flow Statement.

If the DTA *increases*, then the company's cash flow *decreases*, and Cash on the Balance Sheet decreases to offset the DTA increase.

The **intuition** is that the company *appeared* to have "received Cash" from the government since its taxes were negative on the Income Statement – but it did **not** get a "refund."

Instead, the company simply paid $0 in taxes, received no immediate benefit, and accrued the loss for future usage.

If the DTA *decreases*, then the company's cash flow *increases*, and Cash on the Balance Sheet increases to offset the DTA decrease.

The **intuition** is that the company uses some of its NOLs to reduce its taxes. That tax reduction increases the company's Cash balance.

For example, the company might appear to pay $40 in Income Taxes on its Income Statement.

But if it uses its NOL balance to offset its taxable income, and it pays $0 in Cash Taxes, its Cash balance increases by $40.

What Do NOLs Mean in Financial Models?

NOLs count as non-core-business Assets, so you subtract them when moving from Equity Value to Enterprise Value (and you add them when doing the reverse).

In a DCF, it's easiest to ignore NOLs in the Free Cash Flow projections and then include them at the end when moving from Implied Enterprise Value to Implied Equity Value.

In other valuation methodologies (comparable companies and transactions), you must subtract each company's NOLs when moving from its Equity Value to its Enterprise Value.

In a 3-statement projection model, you *should* factor NOLs into the projections if they're significant.

For example, if it's a $5 billion market cap company with $1 billion of revenue, $200 million of Pre-Tax Income, and $1 billion of NOLs, the NOLs are significant.

But if this company has only $10 million of NOLs, the impact will be negligible, so it's less important to include them.

If you do factor in the NOLs, you can use an approach similar to the one shown above:

1. Always use Pre-Tax Income * Tax Rate for the Taxes on a company's Income Statement.

2. Create a separate schedule for the NOLs, and use it to calculate NOLs Created and NOLs Used each year.

3. Reflect the increase or decrease in the DTA on the Cash Flow Statement, and make that change flow into the DTA on the Balance Sheet.

NOLs are *most* important in credit analysis and leveraged buyout models because they can significantly impact a company's Debt repayment capacity.

They are less important in M&A because their usage is often restricted following a deal. Also, they do not affect EPS accretion/dilution because NOLs make no impact on a company's Book Income Statement.

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Key Rule #8: Tax Line Items, Stock-Based Compensation, and PIK Interest

This last section of this guide covers several miscellaneous topics that don't fit in anywhere else.

First, there are many different line items related to **taxes** on the financial statements.

There are Deferred Tax Assets (both Current and Long-Term), Income Taxes Receivable, Deferred Tax Liabilities (Current and Long-Term), and Income Taxes Payable, among others.

All these items relate to **timing differences** between Book and Cash Taxes: What a company records for "taxes" on its Income Statement vs. what it pays the government in cash.

However, these items differ in subtle ways:

- **Deferred Tax Assets (DTAs):** These often correspond to Net Operating Losses and represent, roughly, the company's Tax Rate * Cumulative Net Operating Losses. They may also be created because of tax credits and special treatment of certain expenses.

  DTAs mean that the company's *future cash taxes* will be *lower* than its *future book taxes*. So, if a company records $100 in Income Taxes on its Income Statement in the future, it might pay only $50 in Cash Taxes if it has Deferred Tax Assets.

- **Income Taxes Receivable:** This one represents "refunds" the company is expecting from the federal, state, and local governments because of overpayments in previous periods.

  Tax collection is complex, and most companies have to pay "estimated taxes" over the course of a year; if a company's estimates are too high in one month, it might receive back some of its payments.

Also, if the company uses an NOL *carryback* to get a refund for previous income taxes, it will record the full amount here before receiving it in Cash.

- **Deferred Tax Liabilities (DTLs):** These are the opposite of Deferred Tax Assets: They mean that the company's *future cash taxes* will be *higher* than its *future book taxes*.

  So, if the company records $100 in Income Taxes on its Income Statement in the future, it might pay $120 in Cash Taxes if it has DTLs.

  Often, DTLs get created because a company uses accelerated Depreciation for tax purposes but straight-line Depreciation for book purposes. They are also created in many M&A deals when companies write up assets.

- **Income Taxes Payable:** These represent taxes owed "in the normal course of business." These are NOT extra Cash Taxes owed because of different Depreciation methods or asset write-ups; they exist because the company has not yet paid some of its taxes.

  For example, a company might record a $1,000 tax expense on January 15, but the company only pays taxes in cash at the end of the month, on January 31.

  On January 15, Cash will increase by $1,000 on the Assets side, and Income Taxes Payable on the L&E side will increase by $1,000. On January 31, that reverses, and both Cash and Income Taxes Payable decrease by $1,000.

What Do These Items Mean in Financial Models?

You have to be aware of these tax-related items because they will affect a company's **cash flow** and, therefore, its implied value.

So, if a company is constantly deferring income taxes because of accelerated depreciation or its tax credits, you *should* reflect that in your model.

For example, you might assume that Deferred Income Taxes represent 15% of the company's Book Income Taxes initially and that they decline to 5% by the end of 5-10 years.

You should **not** assume that Deferred Taxes represent a huge percentage of total Income Taxes over the long term; the percentage should decline over time.

You can project the other items as simple percentages of Income Taxes.

Stock-Based Compensation also creates tax complications on the financial statements.

When a company initially awards Stock-Based Compensation, it must estimate the SBC's **Fair Market Value** (FMV) and list it as an expense on the Income Statement.

Often, this expense is embedded within others, such as Sales & Marketing and General & Administrative.

Typically, the company uses Black-Scholes or other options pricing models to estimate the value of options and warrants granted to employees; RSUs and straight stock grants are more straightforward to value.

Even though the company records the Stock-Based Compensation on its Income Statement, it cannot deduct the SBC for Cash-Tax purposes.

The company can deduct the Stock-Based Compensation only when the employees exercise the options or warrants.

So, when the company initially awards the SBC, it records the value of the SBC on the Income Statement and adds it back on the Cash Flow Statement since it's a non-cash expense.

At the same time, the company also adjusts its Deferred Taxes on the CFS to reflect that it cannot, in fact, deduct the SBC. As a result, it pays more in Cash Taxes than Book Taxes initially.

That reduces the company's DTL or, equivalently, increases its DTA.

When the employees finally exercise their options or warrants, the company deducts the *additional* value of those options or warrants for Cash-Tax purposes but does *not* record anything for it on the Income Statement.

So, there will be an adjustment to one of the Deferred Tax line items to indicate that the company has paid less in Cash Taxes than Book Taxes.

This adjustment is typically shown in the "Tax Benefits from Stock-Based Compensation" line item on the CFS.

If the value of these exercised options/warrants exceeds their original value when granted, the company records *another* item called "Excess Tax Benefits from Stock-Based Compensation" on the CFS.

This item is a **negative** within Cash Flow from Operations and a **positive** within Cash Flow from Financing – so the company "re-classifies" this line item out of CFO and into CFF.

Here's a simple example of the entire process: Let's say that a company awards $50 million worth of stock options to an executive today.

That $50 million value is based on Black-Scholes, so the company's current stock price, the options' exercise price, the stock's volatility, the risk-free rate, and other variables factor in.

The company records this $50 million as an expense on its Income Statement, so its Net Income falls by $30 million at a 40% tax rate.

On the Cash Flow Statement, the company's Net Income is down by $30 million, but the SBC is non-cash, so the company adds back $50 million for it.

At the same time, the company also records a Deferred Tax adjusting entry to reflect the fact that the SBC was not deductible for Cash-Tax purposes.

Its Cash Taxes exceed its Book Taxes by $20 million, so this entry is a negative $20 million.

So far, we're down by $30 million, up by $50 million, and down by $20 million, so Cash does not change.

On the Balance Sheet, the Deferred Tax Asset is up by $20 million, APIC is up by $50 million, and Retained Earnings is down by $30 million, so both sides are up by $20 million, and the BS balances.

Now, let's say that several years pass, and the executive finally exercises the options represented by this Stock-Based Compensation.

By this point, the SBC is worth $200 million rather than $50 million because the company's stock price has increased significantly.

When the executive exercises the options, the company deducts the $150 million extra for Cash-Tax purposes.

So, on the Cash Flow Statement, the company records $150 million * 40% = $60 million as a positive entry to reflect this tax deduction. As a result, the company's DTA also decreases.

Originally, the SBC was worth only $50 million, so the company *anticipated* being able to deduct only $50 million * 40% = $20 million.

On the Cash Flow Statement, the company records this $20 million as "Tax Benefits from Stock-Based Compensation" and the *additional $60 million* as "Excess Tax Benefits from Stock-Based Compensation."

The Tax Benefits from Stock-Based Compensation of $20 million are a positive entry, and the Excess Tax Benefits of $60 million are negative.

The company subtracts the Excess Tax Benefits out of CFO and reclassifies them under CFF instead, showing them with a positive sign there.

The *net effect* is that Cash is up by $80 million at the bottom: $60 million from the DTA decrease and $20 million from the Tax Benefits from SBC.

On the Balance Sheet, Cash is up by $80 million on the Assets side, and the DTA is down by $60 million, so the Assets side is up by $20 million.

On the L&E side, APIC in Equity is up by $20 million because of the Tax Benefits from SBC, so both sides are up by $20 million, and the Balance Sheet balances.

How on Earth Do You Reflect Any of This in Financial Models?

Good question!

It's incredibly difficult to reflect any of these items because the treatment of Stock-Based Compensation depends on a company's future stock price performance, how the stock's volatility changes, and other factors that are difficult to predict.

So, we normally recommend setting Stock-Based Compensation on the Cash Flow Statement to 0 – especially in a DCF – and treating it like a normal Cash expense.

That way, you don't have to worry about the projections or the proper numbers for the Tax Benefits and Excess Tax Benefits from SBC.

If you absolutely must project these items, you could make them percentages of the annual SBC expense.

Paid-in-Kind (PIK) Interest

The last item in this section is also one of the simplest.

Normally, companies pay interest in Cash when they raise Debt. For example, if a company raises $100 of Debt and pays 10% interest on it, its Interest Expense will be $10.

But some Debt offers a "Paid-in-Kind" or PIK option where the interest accrues to the loan principal instead.

With PIK Interest, this $10 is a **non-cash** Interest Expense that accrues to the loan principal instead – so the Debt balance will increase to $110 after a year.

However, the company still records Interest Expense of $10 on its Income Statement.

That Interest Expense is non-cash, so the company adds it back on the Cash Flow Statement, and it flows into the Debt line item on the Balance Sheet.

Here's what it looks like on the Income Statement and Cash Flow Statement:

Income Statement

	Current Period: Before Changes:	After Changes:
Revenue:	$ 1,300	$ 1,300
Cost of Goods Sold (COGS):	100	100
Gross Profit:	1,200	1,200
Operating Expenses:	200	200
Depreciation:	-	-
Stock-Based Compensation:	-	-
Amortization of Intangibles:	-	-
Operating Income:	1,000	1,000
Interest Income:	-	-
(Interest Expense):	-	(10)
Gain / (Loss) on Sale of PP&E	-	-
Gain / (Loss) on Sale of ST In	-	-
Goodwill Impairment:	-	-
PP&E Write-Down:	-	-
Write-Down of Owed Debt:	-	-
Pre-Tax Income:	1,000	990
Income Tax Provision:	400	396
Current Portion of Taxes:	400	396
Deferred Portion of Taxes:	-	-
Net Income:	600	594
Preferred Dividends:	-	-
Net Income to Common:	$ 600	$ 594
Common Shares (MM):	1,000	1,000
Earnings Per Share (EPS):	$ 0.60	$ 0.59

Cash Flow Statement

	Current Period: Before Changes:	After Changes:
Operating Activities:		
Net Income to Common:	$ 600	$ 594
Non-Cash Expenses & Other Adjustments:		
Depreciation:	-	-
Stock-Based Compensation:	-	-
Amortization of Intangibles:	-	-
Deferred Income Taxes:	-	-
Paid-in-Kind (PIK) Interest:	-	10
(Gain) / Loss on Sale of PP&E	-	-
(Gain) / Loss on Sale of ST In	-	-
Goodwill Impairment:	-	-
PP&E Write-Down:	-	-
Write-Down of Owed Debt:	-	-
Changes in Operating Assets & Liabilities:		
Accounts Receivable:	-	-
Prepaid Expenses:	-	-
Inventory:	-	-
Accounts Payable:	-	-
Accrued Expenses:	-	-
Deferred Revenue:	-	-
Cash Flow from Operations:	600	604
Investing Activities:		
Buy Short-Term Investments	-	-
Sell Short-Term Investments	-	-
Buy Long-Term Investments	-	-
Sell Long-Term Investments	-	-
Capital Expenditures:	-	-
PP&E Sale Proceeds:	-	-
Cash Flow from Investing:	-	-
Financing Activities:		
Common Dividends Issued:	-	-
Issue Long-Term Debt:	-	-
Repay Long-Term Debt:	-	-
Issue Short-Term Debt:	-	-
Repay Short-Term Debt:	-	-
Issue Preferred Stock:	-	-
Repay Preferred Stock:	-	-
Repurchase Shares:	-	-
Issue New Shares:	-	-
Cash Flow from Financing:	-	-
FX Rate Effects:	-	-
Beginning Cash:	$ 100	$ 100
Increase / (Decrease) in Cash:	$ 600	$ 604
Cash & Cash Equivalents:	$ 700	$ 704

And here's the Balance Sheet:

Balance Sheet	Beginning of Current Period	End of Current Period: Before Changes:	End of Current Period: After Changes:
Assets:			
Current Assets:			
Cash & Cash-Equivalents:	$ 100	$ 700	$ 704
Short-Term Investments:	100	100	100
Accounts Receivable:	100	100	100
Prepaid Expenses:	100	100	100
Inventory:	100	100	100
Total Current Assets:	**500**	**1,100**	**1,104**
Long-Term Assets:			
Plants, Property & Equipmer	1,000	1,000	1,000
Other Intangible Assets:	300	300	300
Long-Term Investments:	100	100	100
Goodwill:	100	100	100
Total Long-Term Assets:	**1,500**	**1,500**	**1,500**
Total Assets:	**$ 2,000**	**$ 2,600**	**$ 2,604**
Liabilities & Equity:			
Current Liabilities:			
Revolver (Short-Term Debt):	$ 100	$ 100	$ 100
Accounts Payable:	200	200	200
Accrued Expenses:	200	200	200
Total Current Liabilities:	**500**	**500**	**500**
Long-Term Liabilities:			
Deferred Revenue:	200	200	200
Deferred Tax Liability:	200	200	200
Long-Term Debt:	100	100	110
Total Long-Term Liabilities:	**500**	**500**	**510**
Total Liabilities:	**$ 1,000**	**$ 1,000**	**$ 1,010**
Equity:			
Shareholders' Equity:			
Common Stock & APIC:	600	600	600
Treasury Stock:	(100)	(100)	(100)
Retained Earnings:	300	900	894
Accum. Other Compr. Incom	100	100	100
Total Shareholders' Equity:	**900**	**1,500**	**1,494**
Preferred Stock:	100	100	100
Total Equity:	**$ 1,000**	**$ 1,600**	**$ 1,594**
Total Liabilities & Equity:	**$ 2,000**	**$ 2,600**	**$ 2,604**
Balance Sheet Balanced?	**OK!**	**OK!**	**OK!**

At first glance, PIK Interest may seem like a great idea: The company gets a tax deduction and it doesn't pay any Cash Interest!

But PIK Interest also creates a **ballooning loan balance** that becomes difficult to repay or refinance after a certain point.

Loans with PIK Interest are common in frothy times when many private equity firms are completing leveraged buyouts and lenders aren't scrutinizing companies in much depth.

But when credit gets tighter, PIK Interest tends to go away.

PIK Interest comes up *most often* in leveraged buyout models and case studies, where the instructions might state that a tranche of Debt has PIK Interest.

When that happens, you'll have to model it correctly – including the Income Statement expense, the add-back on the Cash Flow Statement, and the ever-increasing loan balance.

We cover this topic in more depth in the LBO Modeling guides and case studies, but we wanted to introduce it here.

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Interview Questions

Interview questions on these more advanced accounting and 3-statement modeling topics are **unlikely** unless you've had significant experience in investment banking or private equity.

But even if you have had that experience, you're more likely to receive *case studies* on these topics than interview questions.

If a bank wants to assess your ability to build a 3-statement model, they'll ask you to build one.

If a bank wants to see if you understand PIK Interest, they'll ask you to build an LBO Model that uses it.

Still, you could get questions on these topics – especially "How do the financial statements change with Advanced Accounting Change X?"-type scenarios.

So, we wanted to provide a brief set of questions and answers to guide your preparation.

Three-Statement Projections

You're more likely to receive these questions in the context of case studies or modeling tests that you have to present and explain in interviews.

For example, bankers may ask how you projected revenue for a company or why you picked certain assumptions, and you must be able to justify your numbers.

1. Do you always *need* to project the 3 financial statements for a company?

No. You could easily project only the company's Free Cash Flow by forecasting its Income Statement and the top part of its Cash Flow Statement: Non-cash adjustments, Changes in Working Capital, and CapEx.

Those FCF projections drive a company's implied value and determine its Cash and Debt balances over time, so you don't need a "full" projection of all 3 statements.

Full projections help you to forecast certain items in more granular detail and observe the company's full capital structure over time.

2. What's the main point of projecting a company's financial statements?

You want to capture the company's cash flow and how that cash flow affects the company's Cash, Debt, and Equity over time.

Besides that, the purpose of the projections depends on the model: If you're valuing a company, the projections might be very simple and stop with FCF.

If you're evaluating the company's ability to raise and pay off Debt, you might focus on metrics such as Debt/EBITDA and EBITDA/Interest.

If you're looking at a potential equity investment in the company, you might focus on metrics such as the IRR and MoM multiple.

3. How do you project a company's revenue?

You could use a simple percentage growth rate assumption, base it on Units Sold * Average Unit Price, or base it on Market Share * Total Market Size.

The best method depends on the company's market and how much time and information you have.

For example, if the company discloses Units Sold and Average Unit Prices in its filings, you can use them to forecast its revenue.

But if the company sells hundreds of products at different prices, but operates in a market with a known size and 3-4 major players, you might use Market Share * Total Market Size.

4. How do you project a company's expenses and margins?

You could use simple percentages for all the expenses and link them to revenue; for example, COGS might be 50% of revenue and SG&A might be 20% of revenue.

Or, you could project expenses on a per-employee, per-location, per-unit, or per-factory basis.

For example, you might assume that each widget costs $10 and that costs are increasing by 4% per year.

And then you might assume that the company needs one employee for each $500K of revenue, link the employee count to that, and assume a growth rate for employee salaries and benefits.

Items such as rent, advertising, and administrative expenses may be linked to the company's internal business plans or historical growth rates.

5. How do you project Working Capital items, such as Accounts Receivable, Inventory, and Accounts Payable?

Normally, you assume that these are percentages of revenue, COGS, or operating expenses because most of them relate to a company's core business:

- **Accounts Receivable:** % of Revenue.
- **Prepaid Expense:** % of Operating Expenses.
- **Inventory:** % of COGS.
- **Deferred Revenue:** % of Revenue.
- **Accounts Payable:** % of COGS or Operating Expenses.
- **Accrued Expenses:** % of Operating Expenses.

Then, you assume a specific percentage for each one based on historical trends or averages.

You could also project these metrics using "Days." For example, Days Sales Outstanding = Accounts Receivable / Annual Revenue * 365. This figure represents how long it takes, on average, to collect Receivables from customers.

You might assume that it changes based on historical trends or averages and then calculate the AR number each year based on Days Sales Outstanding.

6. How can you make sure your Working Capital assumptions are reasonable?

You should look at the total Change in Working Capital and compare it to the company's Revenue and Change in Revenue.

The Change in Working Capital represents whether a company *generates* additional Cash or *needs* extra Cash to fund its growth. So, it should trend with the Change in Revenue.

If the Change in WC as a % of the Change in Revenue has been 5-10% historically, it should stay in that same range going forward.

You can also compare the Change in WC to the company's Total Revenue if Change in WC / Change in Revenue does not produce clean, consistent figures.

7. How should you project Depreciation and Capital Expenditures?

You could use several approaches:

- **Simplest:** Make each one a % of revenue.
- **Alternative:** Make Depreciation a % of revenue, but link CapEx to an absolute dollar increase or percentage change.
- **Complex:** Create a PP&E schedule. Estimate a CapEx increase each year based on management's plans, and then depreciate the existing PP&E using each asset's useful life. Depreciating the new CapEx spending right after it takes place. Sum up the total CapEx and total Depreciation each year.

8. Why do you link in the Interest Income and Interest Expense on the Income Statement as the LAST part of the process when projecting the financial statements?

You need the company's Cash and Debt balances to calculate the Interest Income and Interest Expense, so you need the rest of the financial statements first.

You might also use supporting schedules, such as a Debt Schedule, and you create those *after* finishing most of the model.

Finally, depending on the model setup, the Interest link may create a circular reference. Circular references make models more difficult to modify, so you should save this step until the end.

9. What's the key output from a 3-statement projection model?

Besides the company's Cash, Debt, and Equity figures, the key output varies based on the analysis.

If you're analyzing a potential equity investment in a company, the key output is the IRR and MoM multiples under different scenarios.

In a credit analysis, the credit stats and ratios (Debt/EBITDA, EBITDA/Interest, etc.) in different cases are most important.

You might also focus on the company's financial metrics and ratios, such as ROA, ROE, and ROIC, especially if you're doing a "quick assessment" of the company.

10. How do quarterly projections differ from annual projections?

The projection methodology is the same, but you have to use *Year-over-Year (YoY)* figures for the growth rates each quarter due to seasonality (e.g., sales might be the highest in Q4 and the lowest in Q1 each year).

You still make most CFS/BS line items percentages of Income Statement items, but you should base them on the *Last Twelve Months' (LTM)* figures instead.

For example, a company's AR balance at the end of Q2 should be linked to the company's revenue from Q3 of last year into Q2 of this year – *the past 4 quarters*.

It's misleading if you only link AR to revenue in Q2 of this year because the balance might also include much older receivables.

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More Advanced Conceptual Questions

These questions are more likely to come up than the ones on 3-statement projection models in the previous section, but they're still not *that* likely.

You're more likely to get these questions if you've had substantial work experience in finance, you come from an accounting background and you're interviewing with a former accountant, or you've worked on a deal where a concept such as unfunded pensions was important.

1. If a company switches from LIFO to FIFO, how will its Net Income and Cash Flow from Operations change?

This is a trick question because you also need to know how **Inventory Costs** have been changing.

If Inventory Costs have been increasing, Net Income will be higher, and CFO will be lower under FIFO. The company records lower COGS on its Income Statement but also records a greater Inventory Increase on the Cash Flow Statement, which reduces its CFO.

If Inventory Costs have been decreasing, Net Income will be lower, and CFO will be higher under FIFO.

2. What are the trade-offs of LIFO vs. FIFO?

FIFO ("First-In, First-Out") better reflects what the company *actually paid* for the Inventory it is now using in its finished products, while LIFO ("Last-In, First-Out") better reflects the *current prices* of that Inventory.

Under IFRS, only FIFO is allowed; U.S. GAAP allows companies to use either method.

Companies that want to optimize their Net Income and EPS often use FIFO because Inventory Costs tend to increase over time, and FIFO lets them record lower figures for COGS.

But companies that care more about Cash Flow may prefer LIFO.

3. What's the difference between capital leases and operating leases?

It's similar to the difference between owning and renting an apartment.

With capital leases (owning), the company records the leased items as Assets and the capital leases as Debt on its Balance Sheet. The company also records Depreciation and Interest on its Income Statement and principal repayments of the capital leases on its CFS.

With operating leases (renting), the company records nothing on its Balance Sheet and records the rent as a simple operating expense on its Income Statement.

Operating leases are more common for the short-term leasing of equipment and property, while capital leases are more common for longer-term items since they give the lessee ownership rights.

4. How can you make a proper comparison when one company uses all capital leases, and another uses all operating leases?

The easiest method is to use EBITDAR rather than EBITDA to compare the companies; EBITDAR adds the rental expense on the Income Statement to EBITDA so that it completely excludes the effects of *all* leases.

If you use EBITDAR, you also have to capitalize the rental expense for the company using operating leases, usually by multiplying it by 7x or 8x, and add it to metrics like Enterprise Value and Total Debt for use in valuation multiples and credit stats.

And you have to adjust figures like the interest coverage ratio as well – if you use EBITDAR instead of EBITDA, you must use (Interest + Rental Expense) instead of just Interest in the denominator.

5. How would Net Income and Cash Flow from Operations change if a company switches from operating leases to capital leases?

Initially, Net Income would be lower because Depreciation + Interest from capital leases tends to exceed Rent from operating leases. However, Cash Flow from Operations would increase because of the non-cash add-back for Depreciation.

In the longer term, it's harder to predict the exact changes because it depends on the lease terms, how quickly the company repays the capital leases (or if it does at all), and how its rental expense under operating leases changes over time.

Principal repayments on capital leases, shown in Cash Flow from Financing, make it harder to compare the changes in the company's *Net Cash Flow* and *Cash balance*, but this question asks about Cash Flow from Operations.

6. How are Trading, Available-for-Sale (AFS), and Held-to-Maturity (HTM) Securities similar and different from each other?

These security types are similar because they're all used for relatively small stakes in other companies' Debt and Equity.

Also, Realized Gains and Losses and Dividends and Interest Income are treated the same way for all of these – everything appears on the Income Statement and affects the company's taxes.

These securities differ based on their **purpose**, how they're recorded on the **Balance Sheet**, and how they treat **Unrealized Gains and Losses**.

Very short-term investments are classified as Trading Securities, ones with unknown or undetermined holding periods are classified as AFS, and ones that the company plans to hold until maturity are classified as HTM (used most often for bonds).

Trading and AFS Securities are recorded at Fair Market Value on the Balance Sheet, while HTM Securities are shown at amortized cost.

Unrealized Gains and Losses appear on the Income Statement for Trading Securities, within AOCI for AFS Securities, and not at all for HTM Securities.

7. Why might you have to adjust the Book Value of Equity for a company with significant AFS Securities?

Unrealized Gains on AFS Securities can "prop up" a company's Equity and give the impression that a company has more capital available to cover losses than it does.

This point is mostly an issue for commercial banks and insurance firms that are required to keep a certain amount of "capital" on-hand, but it could also come up for normal companies if you're looking at metrics like the Debt/Equity ratio in a credit analysis.

If a company has significant Unrealized Gains or Losses, you might have to adjust its Equity if you believe the company is unlikely to realize these Gains or Losses.

8. How do you factor pensions into a valuation analysis?

First, note that only *defined benefit* pension plans need to be treated differently; *defined contribution* plans have simple operating expenses that don't require special treatment.

If the company has a defined benefit pension plan, and the plan is *underfunded*, then you should **add** the Unfunded Pension (i.e., Pension Benefit Obligations – Pension Plan Assets) when moving from Equity Value to Enterprise Value.

If company contributions into the plan are tax-deductible, then you multiply the Unfunded Pension by (1 – Tax Rate) as well.

Then, when you calculate metrics like EBIT and EBITDA, exclude all the *financing components* of the pension expense so that only the "Service Cost" component affects these numbers.

In an Unlevered DCF, it's best to exclude *all* components of the pension expense in the FCF projections except for the Service Cost. Then, **subtract** the Unfunded Pension at the end when moving from Implied Enterprise Value to Implied Equity Value.

9. What drives a company's Pension Plan Assets and Pension Benefit Obligations?

A company's Pension Plan Assets change based on the return the company earns on those assets (the Actual Return), how much the company contributes (Employer Contributions), how much it pays out to employees (Benefit Payments), and "Other Adjustments," which could include dozens of items.

The liability component – the Pension Benefit Obligations – changes based on the Service Cost (the extra amount the company owes based on employees working longer or earning more), the Interest Cost (the PV of the Liability increasing due to the passage of time), the Experience (Gain) / Loss (actuarial estimates changing), Benefit Payments, and "Other Adjustments."

The Employer Contributions and Benefit Payments are the most predictable, recurring items, so you tend to focus on them in forecasts.

10. How can you tell if a company is using credible assumptions to calculate its Pension Assets, Liabilities, and Pension Expense on the Income Statement?

First, check that the company's "expected return" percentages are reasonable. If the company is investing mostly in fixed income rather than equities, it should **not** be using a rate of return linked to the stock market's average annual return.

Most companies should use a percentage that's *below* the average market return to be more conservative.

Then, check the discount rate and salary increase rate for the liability component. If salaries have increased 4% per year historically, the company should not assume 1% in future periods.

Finally, check the pension plan's targeted vs. actual allocation. If the company "plans" to invest 60% in fixed income and 40% in equities, but the split has been closer to 30% / 70%, you have a problem.

11. Why is the Pension Expense on the Income Statement often added back on the CFS?

Because the pension expense on the Income Statement is mostly a non-cash expense.

Its main components are the Service Cost, the Interest Cost, the *Expected* Return on Plan Assets, the Amortization of Net Losses, Gains, and Prior Service Costs, and "Other Adjustments."

None of those items represents an upfront cash outlay. Even the Service Cost, which qualifies as an "operational expense," is **not** a cash expense – it's the *accrual* of future expenses because of salary increases or additional years for employees.

On the Cash Flow Statement, most companies add back all, or a significant portion, of this Income Statement expense and then reflect their cash contributions into the pension plan.

12. How is a 30% or 80% acquisition different from a 100% one on the financial statements?

In a 30% acquisition, the buyer does not consolidate its financial statements with those of the seller, it does not create Goodwill or allocate the purchase price, and it records a single Asset on the BS for this minority stake: "Equity Investments" or "Associate Companies."

After the acquisition, the company *adds* 30% * Other Company's Net Income at the bottom of its Income Statement and subtracts it on the Cash Flow Statement. This "Net Income Attributable to Equity Investments" then flows into Equity Investments on the BS.

In an 80% acquisition, the buyer consolidates its financial statements 100% with those of the seller, it creates Goodwill, it allocates the purchase price, and it writes up assets.

It also records a "Noncontrolling Interest" line item on the L&E side of the Balance Sheet to represent the portion of the other company it does *not* own (20% here).

After the acquisition, the company *subtracts* 20% * Other Company's Net Income at the bottom of its Income Statement and adds it back on the Cash Flow Statement. This Net Income Attributable to Noncontrolling Interests then flows into Noncontrolling Interests on the BS.

13. How do Net Operating Losses (NOLs) affect a company's financial statements?

Nothing changes on the Income Statement when NOLs are accrued or used; you adjust for these items on the Cash Flow Statement and Balance Sheet.

For example, if a company has Pre-Tax Income of negative $100, it still records its taxes using its Tax Rate * ($100), so the company shows a *Tax Benefit* on the IS.

But in reality, the company doesn't receive a Tax Benefit; it simply pays nothing in Cash Taxes.

So, on the Cash Flow Statement, the company records a ($40) entry to reflect the fact that no tax benefit was received (assuming a 40% tax rate).

The company's DTA increases by $40, and its off-Balance Sheet NOL balance increases by $100.

If the company earns positive Pre-Tax Income in the future, it can use its NOL balance to reduce its Taxable Income. It still records Pre-Tax Income * Tax Rate for taxes on the IS, but it makes an adjusting entry on the CFS to reflect the lower Cash Taxes.

The off-Balance Sheet NOL balance declines by the NOLs used each year, and the Deferred Tax Asset changes by (NOLs Created – NOLs Used) * Tax Rate.

14. How do NOLs factor into financial projections and valuations?

When moving from Equity Value to Enterprise Value, you subtract NOLs since they count as non-core-business Assets.

In a 3-statement projection model, you can factor in NOLs using the method described above: Make adjusting entries on the CFS to show what a company is paying in Cash Taxes over time.

In a DCF analysis, it's easiest to ignore NOLs completely in the FCF projections and simply *add them* at the end when moving from Implied Enterprise Value to Implied Equity Value.

15. What's the difference between Tax Benefits from Stock-Based Compensation and Excess Tax Benefits from Stock-Based Compensation?

Both items are recorded when employees *exercise* options or warrants they previously received. These items arise because companies cannot deduct Stock-Based Compensation for Cash-Tax purposes when it is initially granted – only when employees exercise the SBC.

The difference is that Tax Benefits from Stock-Based Compensation reflects what the company *expected* to deduct based on the value of the SBC at the time it was issued.

For example, $100 Original Value of SBC * 40% Tax Rate = $40 in Tax Benefits from SBC. It's a non-cash adjustment within Cash Flow from Operations on the CFS, and it flows into APIC on the Balance Sheet.

Excess Tax Benefits reflects the *additional amount* the company can deduct as a result of these options and warrants increasing in value over time. For example, if the value of the SBC has increased to $300, the Excess Tax Benefits would be ($300 – $100) * 40% Tax Rate = $80.

The company subtracts this item out of Cash Flow from Operations and adds it back in Cash Flow from Financing, effectively "re-classifying it."

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Advanced Accounting Scenarios on the Financial Statements

This section contains the most likely interview questions in this guide.

You could easily get questions about Equity Investments, Noncontrolling Interests, Deferred Taxes, and different security types – especially if you have accounting work experience.

You're less likely to receive "How do the financial statements change?"-type questions about LIFO/FIFO, pensions, and lease types because those topics are more difficult to frame in terms of specific numbers.

1. Company A owns 70% of Company B. The financial statements have already been consolidated 100%, and Company A has created Goodwill and the Noncontrolling Interest.

Company A issues Dividends of $200, and Company B generates Net Income of $100 and issues Dividends of $50. Walk me through the financial statements when this happens.

On the Income Statement, Company A subtracts Net Income Attributable to Noncontrolling Interests of 30% * $100 = $30 at the bottom, so Net Income is down by $30.

On the Cash Flow Statement, Net Income is down by $30, but you add back Net Income Attributable to Noncontrolling Interests since it's non-cash.

Initially, Company A records 100% of both Company A and Company B's Dividends, so it shows a negative $250 on the CFS.

But Company A also receives 70% of Company B's Dividends, so it records an add-back for 70% * $50 = $35 to reflect this.

So, Cash at the bottom of the CFS is down by $215.

On the Balance Sheet, Cash is down by $215, so the Assets side is down by $215.

On the L&E side, Retained Earnings is down by $200 + $30 = $230 to reflect Company A's Dividends and the reduced Net Income.

The Noncontrolling Interest increases by $30 because of the Net Income Attributable to NCI, but then decreases by $15 because of Company B's Dividends, so the NCI is up by $15.

The L&E side, therefore, is down by a total of $215, and both sides balance.

2. Company A owns 30% of Company B. It has already recorded the Cash it paid to purchase this 30% stake and created an Equity Investment line item for it.

Company B earns $20 in Net Income and issues $10 in Dividends. Walk me through the financial statements when this happens.

On the Income Statement, Company A adds $20 * 30% = $6 in Net Income Attributable to Equity Investments at the bottom, so Net Income is up by $6.

On the Cash Flow Statement, Net Income is up by $6, but Company A must subtract Net Income Attributable to Equity Investments since it hasn't received these earnings in cash.

However, it *does* receive Company B's Dividends in Cash, so we make a positive adjusting entry for $10 * 30% = $3, and Cash at the bottom is up by $3.

On the Balance Sheet, Cash is up by $3 on the Assets side, and the Equity Investments line item is up by $6 because of the Net Income Attributable to Equity Investments.

But then it decreases by $3 because of the Dividends, so the Assets side is up by $6.

On the L&E side, Retained Earnings is up by $6 because of the increased Net Income, so both sides balance.

3. What would change if Company A owned only 10% of Company B?

Technically, Company A should record its investment in Company B as a "security" rather than an Equity Investment in this scenario, so the accounting treatment for AFS or Trading Securities might apply.

As a result, Company A might record the Dividends Received from Company B, but not its Net Income, on its Income Statement.

However, these rules are vaguely defined, and many companies would continue to use Equity Investment accounting as long as they exert "significant influence" over Company B.

4. A company with an underfunded, defined benefit pension contributes $1,000 and records a Service Cost of $200 to reflect increases in employee compensation this year.

Assume that pension plan contributions are NOT tax-deductible, and that the company pays a 40% tax rate. How do its financial statements change?

On the Income Statement, the Service Cost of $200 reduces Pre-Tax Income by $200, so Net Income decreases by $120 at a 40% tax rate.

On the CFS, Net Income is down by $120, but you add back this Service Cost of $200 since it's non-cash. You also subtract the company's pension contributions of $1,000, so Cash at the bottom is down by $920.

On the BS, Cash is down by $920, but the Pension Plan Assets are up by $1,000 because of the employer contributions, so the Assets side is up by $80.

On the L&E side, the Pension Liability increases by $200 because of the Service Cost, and Retained Earnings decreases by $120 because of the reduced Net Income. Both sides increase by $80, and the Balance Sheet balances.

Intuition: The $1,000 company contribution costs them a lot of Cash, but they save a bit in taxes because of the Service Cost.

5. Walk me through what happens when a company pays $20 in Interest on Debt, with $10 in Cash Interest and $10 in Paid-in-Kind (PIK) Interest. Assume a 40% tax rate.

On the Income Statement, the company records $20 in Total Interest, so Pre-Tax Income declines by $20, and Net Income falls by $12, assuming a 40% tax rate.

On the Cash Flow Statement, Net Income is down by $12, but the company adds back the $10 in PIK Interest, so Cash Flow is down by $2, and Cash at the bottom is down by $2.

On the Balance Sheet, Cash is down by $2, so the Assets side is down by $2.

On the L&E side, Debt increases by $10 because of the PIK Interest, and Equity falls by $12 due to the reduced Net Income. The L&E side is down by $2, and both sides balance.

Intuition: The PIK Interest creates a small amount of tax savings, so Cash doesn't fall by quite as much as it would have with $20 in Cash Interest.

6. A company records Stock-Based Compensation of $100, but this SBC is *not* deductible for Cash-Tax purposes. What happens on the financial statements, assuming a 40% tax rate?

The company's Pre-Tax Income falls by $100, so its Net Income falls by $60.

On the CFS, the company's Net Income is $60 lower, but it adds back the SBC as a $100 non-cash expense, so cash flow is up by $40 at first.

However, the company did not truly reduce its Cash Taxes, so it must record a negative $40 adjusting entry under Deferred Taxes to represent that. Its Cash at the bottom stays the same.

On the Balance Sheet, Cash on the Assets side stays the same, but the company's DTA increases by $40 because of the negative Deferred Taxes on the CFS, so the Assets side is up by $40.

On the L&E side, Retained Earnings is $40 higher because Net Income was down by $60, but Stock-Based Compensation increased Common Stock & APIC by $100. Both sides are up by $40 and balance.

Intuition: The company paid nothing and saved nothing in taxes, but it expects to be able to reduce its taxes in the future.

7. Two years later, the employees who received this SBC finally exercise their options, which are now worth $400 rather than $100.

The company can now deduct this expense for Cash-Tax purposes. What happens on the financial statements?

Nothing changes on the Income Statement.

On the Cash Flow Statement, the company can now deduct $400 – $100 = $300, so it records this $300 * 40% = $120 as a positive entry under Deferred Taxes.

The company also records $100 * 40% = $40 in Tax Benefits from Stock-Based Compensation, so cash flow is up by $160 at this point.

But then, the company must subtract $300 * 40% = $120 in Excess Tax Benefits from Stock-Based Compensation and add it back in Cash Flow from Financing, re-classifying it there.

Those changes cancel each other out, so Cash is still up by $160 at the bottom.

On the Balance Sheet, Cash is up by $160, and the DTA is down by $120, so the Assets side is up by $40.

On the L&E side, APIC is up by $40 because of the Tax Benefits from SBC, so both sides are up by $40 and balance.

Intuition: The company gets extra Cash by deducting the SBC ($400 * 40% = $160).

8. A company records Book Depreciation of $10 per year for 3 years.

On its Tax financial statements, it records Depreciation of $15 in Year 1, $10 in Year 2, and $5 in Year 3.

Walk me through what happens on the BOOK financial statements in Year 1, assuming a 40% tax rate.

On the Book Income Statement, you list the Book Depreciation number, so Pre-Tax Income falls by $10, and Net Income falls by $6.

On the Tax Income Statement, Depreciation is $15, so Net Income falls by $9 rather than $6. Taxes fall by $2 extra on the Tax Income Statement.

On the Book Cash Flow Statement, Net Income is down by $6, but you add back the Depreciation of $10 and the $2 of Deferred Taxes to represent the fact that Cash Taxes were lower than Book Taxes in Year 1.

At the bottom, Cash is up by $6.

On the Balance Sheet, Cash is up by $6, but PP&E is down by $10 due to the Depreciation, so the Assets side is down by $4.

On the other side, the Deferred Tax Liability increases by $2 due to the Book vs. Cash Tax difference. Equity is down by $6 due to the lower Net Income, so both sides are down by $4 and balance.

Intuition: The company gets a bit of extra Cash – $6 rather than the normal $4 – because it deducts a higher Depreciation for tax purposes in Year 1.

9. Now let's move to Year 2. What happens?

On the Income Statement, Pre-Tax Income is down by $10, so Net Income falls by $6. The Book and Tax versions of the IS are the same since Depreciation is the same on both.

On the Cash Flow Statement, Net Income is down by $6, and you add back the $10 of Depreciation, but there are no changes to Deferred Taxes because Book Taxes = Cash Taxes this year. Cash at the bottom increases by $4.

On the Balance Sheet, Cash is up by $4, but PP&E is down by $10, so the Assets side is down by $6. Equity is down by $6 due to the reduced Net Income, so both sides are down by $6 and balance.

Intuition: This is a standard "What happens when Depreciation increases by $10?" question – the company gets $4 extra Cash because of the tax savings.

10. Finally, let's move to Year 3. What happens?

On the Book Income Statement, you use the Book Depreciation number, so Pre-Tax Income falls by $10, and Net Income falls by $6.

On the Tax Income Statement, Depreciation is $5, so Net Income falls by $3 rather than $6. Taxes fall by $2 less on the Tax version of the IS.

On the Book Cash Flow Statement, Net Income is down by $6, but you add back the Depreciation of $10 and subtract the $2 to represent how Cash Taxes are higher than Book Taxes in Year 1.

At the bottom, Cash is up by $2.

On the Balance Sheet, Cash is up by $2, but PP&E is down by $10 due to the Depreciation, so the Assets side is down by $8.

On the L&E side, the Deferred Tax Liability decreases by $2 due to the Book vs. Cash Tax difference, and Equity is down by $6 due to the reduced Net Income, so both sides are down by $8 and balance.

Intuition: The company now earns a bit less in extra Cash ($2 rather than $4) because it records a lower Depreciation deduction for tax purposes.

11. A company records a Goodwill Impairment of $100. However, this Goodwill Impairment is NOT deductible for Cash-Tax purposes.

Walk me through how the 3 statements change, assuming a 40% tax rate.

On the Book Income Statement, Pre-Tax Income still falls by $100 due to the Impairment, so Net Income falls by $60.

On the Tax Income Statement, Pre-Tax Income stays the same, so Net Income stays the same. As a result, Cash Taxes are $40 higher than Book Taxes.

On the Cash Flow Statement, Net Income is down by $60, but we add back the $100 Impairment since it is non-cash.

Then, we also subtract $40 in the Deferred Taxes line item because Cash Taxes are higher than Book Taxes.

Cash at the bottom does not change.

On the Balance Sheet, Cash stays the same, but Goodwill is down by $100 due to the Impairment, so the Assets side is down by $100.

On the L&E side, the Deferred Tax Liability is down by $40, and Equity is down by $60 due to the reduced Net Income, so both sides are down by $100 and balance.

Intuition: The company's Goodwill decreases, but it doesn't save anything on taxes as a result, so its Cash balance stays the same.

12. A company has a Net Operating Loss (NOL) balance of $100.

The company finally generates a Pre-Tax Income of positive $200 this year. Walk me through the financial statements, assuming a 40% tax rate.

On the Income Statement, the company still records Pre-Tax Income of $200, Taxes of $80, and Net Income of $120.

On the Cash Flow Statement, Net Income at the top is up by $120.

The company can apply $100 of NOLs to reduce its Taxable Income, so it only pays taxes on $100 of Pre-Tax Income rather than $200.

As a result, its Cash Taxes are $40 rather than $80.

You record this as a positive $40 adjusting entry under Deferred Taxes, so Cash at the bottom is up by a total of $120 + $40 = $160.

On the Balance Sheet, Cash on the Assets side is up by $160, but the Deferred Tax Asset is down by $40, so the Assets side is up by $120.

The L&E side is also up by $120 because of the $120 increase in Net Income, which flows into Retained Earnings. Both sides balance.

Intuition: The company's Cash balance increases by more than expected because it uses losses from previous years to reduce its taxes this year.

13. You're analyzing a company with $100 in Short-Term Investments on its Balance Sheet. These Investments are classified as Available-for-Sale (AFS) Securities.

The fair market value of these securities increases to $110. Walk me through what happens on the 3 statements.

Since these are AFS securities, you do not report Unrealized Gains and Losses on the Income Statement, so there are no changes there. There are also no changes to the Cash Flow Statement.

On the Balance Sheet, the Short-Term Investments line item increases by $10 on the Assets side, and Accumulated Other Comprehensive Income (AOCI) increases by $10 on the L&E side under Equity, so the Balance Sheet balances.

14. Assume that these investments are classified as Trading Securities instead. Walk me through the financial statements after their value increases by $10.

With Trading Securities, you *do* show Unrealized Gains and Losses on the Income Statement.

So, on the Income Statement, Pre-Tax Income increases by $10, and Net Income increases by $6 at a 40% tax rate.

On the Cash Flow Statement, Net Income is up by $6, but you subtract the $10 Unrealized Gain because it's non-cash, so Cash at the bottom is down by $4.

On the Balance Sheet, Cash is down by $4, and Short-Term Investments is up by $10, so the Assets side is up by $6.

On the other side, Equity is up by $6 due to the increased Net Income. Both sides balance.

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