

Financial Modeling Fundamentals – Module 04

3-Statement Projections – Quiz Questions

1. Suppose that you have built revenue projections over five years for a software company, as shown below:

Revenue Assumptions:	Units	Historical				Projected				
		FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Total Revenue:	\$ M	\$ 102.0	\$ 110.0	\$ 149.4	\$ 200.0	\$ 250.1	\$ 303.6	\$ 358.6	\$ 411.7	\$ 459.0
Revenue Growth Rate:	%	72.9%	7.8%	35.8%	33.9%	25.1%	21.4%	18.1%	14.8%	11.5%
OnDemand Revenue:	\$ M	3.1	6.6	12.0	19.0	26.4	34.0	42.0	49.8	56.4
Download Revenue:	\$ M	98.9	103.4	137.4	181.0	223.7	269.6	316.6	361.9	402.6
Total # of Customers:	# Customers	17,000	21,000	28,000	35,000	42,788	50,628	58,248	65,080	70,531
% OnDemand Customers:	%	5.0%	10.0%	13.0%	15.0%	16.6%	17.5%	18.3%	18.8%	19.1%
OnDemand Customers:	# Customers	850	2,100	3,640	5,250	7,088	8,859	10,631	12,226	13,449
Growth Rate:	%	N/A	147.1%	73.3%	44.2%	35.0%	25.0%	20.0%	15.0%	10.0%
Download Customers:	# Customers	16,150	18,900	24,360	29,750	35,700	41,769	47,617	52,854	57,083
Growth Rate:	%	N/A	17.0%	28.9%	22.1%	20.0%	17.0%	14.0%	11.0%	8.0%
Average OnDemand Customer Value:	\$ Thousands	3,600	3,143	3,284	3,619	3,728	3,839	3,955	4,073	4,195
Growth Rate:	%	N/A	(12.7%)	4.5%	10.2%	3.0%	3.0%	3.0%	3.0%	3.0%
Average Download Customer Value:	\$ Thousands	6,126	5,471	5,642	6,084	6,267	6,455	6,648	6,848	7,053
Growth Rate:	%	N/A	(10.7%)	3.1%	7.8%	3.0%	3.0%	3.0%	3.0%	3.0%

How might you check the revenue figures in the 5-year projection period to ensure they are reasonable?

- Verify that the overall revenue growth rate declines over time.
- Check to make sure that the projected growth rates in the future closely match historical growth rates from the past four years.
- Check to make sure that, even for a high-growth company like this, it takes progressively longer for the company to double its revenue.
- Compare the projected growth rates to the expectations for the industry as a whole.

- 2. Referring to the screenshot above once again, which of the following factors might explain why we have assumed a substantial growth rate in OnDemand and Download customers, but not in product pricing (i.e., Average Customer Value)?**
- a. The company may have dropped its prices historically, as indicated by the percentages in FY12, which implies that it may not be aiming to increase its prices in the future.
 - b. Generally speaking, it is poor modeling practice to assume a significant increase in pricing because it's too much of a "free lunch" for companies.
 - c. The company may have so many different products at so many different price points that it would be exceptionally difficult to make granular estimates for the pricing changes.
 - d. Most software companies tend to realize lower average customer values as they grow because they focus more on smaller customers as opposed to large enterprises.
 - e. We simply have less insight into the company's pricing and average customer value than we do into the company's customer counts by segment.

3. Consider the following expense assumptions over the 5-year projection period for the same company:

Expense Assumptions:	Units	Historical				Projected				
		FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Cost of Sales % Revenue:	%	12.2%	12.3%	11.8%	10.4%	10.1%	9.9%	9.6%	9.4%	9.1%
Annual Margin Improvement:	%	N/A	0.12%	(0.43%)	(1.50%)	0.25%	0.25%	0.25%	0.25%	0.25%
Research & Development % Revenue:	%	41.0%	39.0%	39.0%	40.0%	39.8%	39.8%	39.8%	39.8%	39.8%
Existing Customers:	# Customers	12,000	17,000	21,000	28,000	35,000	42,788	50,628	58,248	65,080
New Customers:	# Customers	5,000	4,000	7,000	7,000	7,788	7,841	7,620	6,833	5,451
Sales & Marketing Spend, Existing Customers:	\$ M	15.0	14.7	17.1	26.5	36.4	48.6	62.0	76.4	90.5
Sales & Marketing Spend, New Customers:	\$ M	7.4	6.2	11.3	14.5	18.6	21.5	23.9	24.5	22.3
Sales & Marketing \$ per Existing Customer:	\$ Thousands	1,250	865	814	946	1,041	1,135	1,226	1,311	1,390
Growth Rate in S&M per Existing Customer:	%	N/A	(30.8%)	(5.8%)	16.2%	10.0%	9.0%	8.0%	7.0%	6.0%
Sales & Marketing \$ per New Customer:	\$ Thousands	1,488	1,550	1,612	2,071	2,382	2,739	3,137	3,592	4,094
Growth Rate in S&M per New Customer:	%	N/A	4.2%	4.0%	28.5%	15.0%	15.0%	14.5%	14.5%	14.0%
G&A - Fixed Expenses:	\$ M	5.0	5.3	5.6	5.9	6.2	6.5	6.8	7.1	7.4
Growth Rate in G&A - Fixed Expenses:	%	N/A	6.0%	5.7%	5.4%	5.0%	5.0%	4.5%	4.5%	4.0%
G&A - Variable Expenses:	\$ M	8.3	9.0	14.1	20.1	26.3	31.9	39.4	45.3	52.8
G&A - Variable Expenses % Revenue:	%	8.1%	8.2%	9.5%	10.1%	10.5%	10.5%	11.0%	11.0%	11.5%

What is MOST unusual about these assumptions?

- The Cost of Sales as a % of Revenue is decreasing rather than staying the same or increasing; this almost never happens.
- Sales & Marketing spending is very different for new customers than it is for existing customers, which is unusual.
- Research & Development as a % of Revenue is very high, at 40%, and stays the same over the next five years.
- The General & Administrative expense has both a fixed and a variable component, which rarely happens since G&A is typically just a % of Revenue.

4. In a 3-statement model like the one shown above, why is it important to distinguish between sales & marketing spending on new vs. existing customers?

- Because existing customers tend to be more profitable, especially with a subscription model.
- Because there are far more existing customers than there are new customers, so the spending levels must be appropriate for each segment.
- Because the company's spending patterns may change in the future if it decides to target different types of customers.
- All of the above.

5. Consider the following CapEx and Depreciation Schedule, in which we have conveniently hidden all the "Depreciation from New CapEx" figures:

CapEx and Depreciation Schedule:	Units	Historical				Projected				
		FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Total Existing Net PP&E:	\$ M				\$ 18.9					
Depreciation of Existing Net PP&E:	%					45.0%	30.0%	10.0%	10.0%	5.0%
Depreciation of Existing Net PP&E:	\$ M					\$ 8.5	\$ 5.7	\$ 1.9	\$ 1.9	\$ 0.9
Useful Life of New PP&E:	# Years	5.0								
Annual CapEx:	\$ M	7.1	7.5	12.3	15.5	18.6	21.9	25.9	30.0	34.8
% Revenue:	%	7.0%	6.8%	8.2%	7.8%	7.4%	7.2%	7.2%	7.3%	7.6%
Annual Growth %:	%	N/A	5.6%	64.0%	26.0%	20.0%	18.0%	18.0%	16.0%	16.0%
Depreciation on New CapEx - Year 1:	\$ M									
Depreciation on New CapEx - Year 2:	\$ M									
Depreciation on New CapEx - Year 3:	\$ M									
Depreciation on New CapEx - Year 4:	\$ M									
Depreciation on New CapEx - Year 5:	\$ M									
Total Depreciation on New CapEx:	\$ M									

Based on this schedule, please calculate the Total Depreciation on New CapEx in Year 3, and select the answer choice that matches your calculation below:

- \$10.4 million.
- \$9.5 million.
- \$8.1 million.
- \$13.3 million.

- 6. Suppose that you have built a PP&E Schedule similar to the one above. Which of the following conditions might you check to verify that you are using reasonable assumptions?**
- a. CapEx as a % of Revenue should almost always be rising over time for a high-growth company like this one.
 - b. The CapEx annual growth rate should be in-line with historical growth rates, perhaps declining modestly each year as the company grows.
 - c. Particularly if a company is growing quickly, CapEx as a % of Revenue will often exceed Depreciation as a % of Revenue.
 - d. In the long-term, Total CapEx should always equal Total Depreciation because the company's Net PP&E balance should not be changing.
 - e. CapEx as a % of Revenue should be falling over time because companies have lower re-investment needs as their businesses grow.

7. Consider the screenshot shown below of the Balance Sheet and Cash Flow Statement drivers for the 3-statement projection model you are building:

Balance Sheet and Cash Flow Statement Drivers:	Units	Historical				Projected				
		FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Trade and Other Receivable % Revenue:	%	15.0%	14.7%	15.6%	17.3%	16.6%	16.9%	17.2%	17.5%	17.8%
Inventories % COGS:	%	16.5%	14.2%	18.1%	17.2%	16.5%	16.5%	16.5%	16.5%	16.5%
Trade and Other Payables % OpEx:	%	14.8%	19.1%	11.2%	17.5%	15.7%	15.7%	15.7%	15.7%	15.7%
Accrued Expenses % OpEx:	%	6.2%	5.0%	7.1%	6.6%	6.2%	6.2%	6.2%	6.2%	6.2%
Deferred Revenues % Revenue:	%	3.0%	5.5%	6.1%	7.5%	7.5%	8.5%	9.5%	10.5%	11.5%
Stock-Based Compensation % OpEx:	%	4.0%	5.3%	5.7%	5.1%	5.0%	5.0%	5.0%	5.0%	5.0%
Deferred Taxes % Total Income Taxes:	%	0.0%	33.9%	28.4%	39.3%	35.0%	35.0%	35.0%	35.0%	35.0%
Other Investing Activities % Revenue:	%	0.0%	2.0%	2.4%	2.1%	2.5%	2.5%	2.5%	2.5%	2.5%
FX Rate Effects % Revenue:	%	4.9%	(3.9%)	4.1%	5.1%	2.5%	2.5%	2.5%	2.5%	2.5%
New Equity Issued by Company:	\$ M	-	-	-	-	-	-	-	-	-

For what possible reason(s) would you make Accounts Receivable (AR) as a % of Revenue and Deferred Revenue (DR) as a % of Revenue change over time, but keep the other percentages shown here constant over the next 5 years?

- AR and DR as a % of Revenue are both following a clear trend of increasing over time, whereas the trend is more “random” for the other line items.
- Most companies provide detailed guidance on their expected Working Capital requirements, so we are likely just following the company’s plans as disclosed in its filings.
- The AR and DR balances will both increase over time as a company’s revenue grows, since it will have more receivables and more cash to be recognized as revenue in the future.
- The company may be shifting to a subscription-based model where customers pay in cash upfront and then receive the service over time, so DR as a % of Revenue should be increasing.
- We’re following historical trends – if an item jumps around, we tend to use the average percentage and hold it constant, but if it follows a trend, we continue that trend.

- 8. You're linking Inventory to Cost of Goods Sold (COGS) in order to project it over a 5-year period. Over the past three historical years, Inventory / COGS was 10% on average. What does that mean?**
- a. 10% is far too low, so you should project Inventory in a different way and not link it to COGS.
 - b. It means that, on average, the company goes through its Inventory balance and sells off all its Inventory 10 times per year.
 - c. It means that your calculations are off, because Inventory on the Balance Sheet should always exceed COGS.
 - d. You can't say anything definitive without more detailed information.

9. Consider the Income Statement projections shown below, for the same company we have been using in these examples:

Statement of Profit or Loss:	Units	Historical				Projected				
		FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Revenue from Continuing Operations:	\$ M	\$ 102.0	\$ 110.0	\$ 149.4	\$ 200.0	\$ 250.1	\$ 303.6	\$ 358.6	\$ 411.7	\$ 459.0
Revenue Growth:	%	72.9%	7.8%	35.8%	33.9%	25.1%	21.4%	18.1%	14.8%	11.5%
Cost of Sales:	\$ M	12.4	13.5	17.7	20.7	25.3	29.9	34.4	38.5	41.8
Gross Profit:	\$ M	89.6	96.5	131.7	179.3	224.9	273.7	324.2	373.2	417.3
Gross Margin:	%	87.8%	87.7%	88.2%	89.7%	89.9%	90.2%	90.4%	90.7%	90.9%
Operating Expenses:										
Research & Development Expense:	\$ M	41.8	42.9	58.3	80.0	99.4	120.7	142.5	163.7	182.5
Sales & Marketing Expense:	\$ M	22.4	20.9	28.4	41.0	55.0	70.0	85.9	100.9	112.8
General & Administrative Expense:	\$ M	13.3	14.3	19.7	26.0	32.5	38.4	46.2	52.4	60.2
Depreciation and Amortization:	\$ M	5.1	6.6	8.9	11.1	11.3	11.9	12.3	17.3	22.2
Total Operating Expenses:	\$ M	82.6	84.7	115.3	158.1	198.1	241.0	287.0	334.2	377.6
Results from Continuing Activities (EBIT):	\$ M	7.0	11.8	16.4	21.2	26.7	32.7	37.2	39.0	39.7
Operating (EBIT) Margin:	%	6.8%	10.7%	11.0%	10.6%	10.7%	10.8%	10.4%	9.5%	8.6%
Net Financing Costs:	\$ M	-	-	-	-	-	-	-	-	-
Profit Before Income Tax:	\$ M	7.0	11.8	16.4	21.2	26.7	32.7	37.2	39.0	39.7
Income Tax Expense:	\$ M	(2.1)	(3.5)	(4.9)	(6.4)	(8.0)	(9.8)	(11.2)	(11.7)	(11.9)
Profit / (Loss) for the Period:	\$ M	\$ 4.9	\$ 8.3	\$ 11.5	\$ 14.8	\$ 18.7	\$ 22.9	\$ 26.0	\$ 27.3	\$ 27.8
Effective Tax Rate:	%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
EBITDA:	\$ M	12.1	18.4	25.3	32.3	38.0	44.6	49.4	56.3	61.8
EBITDA Margin:	%	11.8%	16.7%	17.0%	16.2%	15.2%	14.7%	13.8%	13.7%	13.5%

As you can see, the company's EBITDA margin declines from 16.2% in the most recent historical year to 13.5% in Year 5 of the projected period. What is the BEST explanation for this decline?

- Research & Development as a % of Revenue stays very high, at 40%, which will reduce the company's EBITDA margins.
- The General & Administrative expense as a % of Revenue increases over this period, which explains the ~3% drop in EBITDA margins.
- The company's Revenue growth rate slows down substantially, dropping to only 11.5% by the end of the projected period; this lower growth rate will also reduce margins.
- Sales & Marketing as a % of Revenue increases and explains nearly all of this ~3% drop in EBITDA margins.

10. Consider the Cash Flow Statement projections for this same company, as shown below:

Statement of Cash Flows:	Units	Historical				Projected				
		FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
CASH FLOWS FROM OPERATING ACTIVITIES:										
Net Profit / (Loss) After Income Tax:	\$ M	\$ 4.9	\$ 8.3	\$ 11.5	\$ 14.8	\$ 18.7	\$ 22.9	\$ 26.0	\$ 27.3	\$ 27.8
Adjustments for Non-Cash Charges:										
Depreciation and Amortization:	\$ M	5.1	6.6	8.9	11.1	11.3	11.9	12.3	17.3	22.2
Stock-Based Compensation Expense:	\$ M	3.3	4.5	6.6	8.1	10.0	12.1	14.5	16.8	19.0
Deferred Income Taxes:	\$ M	-	1.2	1.4	2.5	2.8	3.4	3.9	4.1	4.2
Changes in Operating Assets and Liabilities:										
Trade and Other Receivables:	\$ M	(2.0)	(0.9)	(7.1)	(11.3)	(6.9)	(9.8)	(10.4)	(10.4)	(9.7)
Inventories:	\$ M	0.5	0.1	(1.3)	(0.4)	(0.6)	(0.8)	(0.7)	(0.7)	(0.5)
Trade and Other Payables:	\$ M	2.3	3.9	(3.3)	14.8	3.4	6.7	7.2	7.4	6.8
Accrued Expenses:	\$ M	2.4	(0.9)	3.9	2.3	1.9	2.7	2.9	2.9	2.7
Deferred Revenues:	\$ M	2.0	3.0	3.1	5.9	3.8	7.0	8.3	9.2	9.6
Other Changes, Net:	\$ M	(1.5)	0.6	1.2	(2.2)	-	-	-	-	-
Net Cash Provided by Operating Activities:	\$ M	\$ 17.0	\$ 26.4	\$ 24.9	\$ 45.6	\$ 44.2	\$ 56.2	\$ 63.9	\$ 73.9	\$ 82.0
CASH FLOWS FROM INVESTING ACTIVITIES:										
Purchases of Property, Plant, & Equipment (CapEx):	\$ M	(7.1)	(7.5)	(12.3)	(15.5)	(19.4)	(24.2)	(29.1)	(34.9)	(41.2)
Other Investing Activities:	\$ M	-	(2.2)	(3.6)	(4.2)	(6.3)	(7.6)	(9.0)	(10.3)	(11.5)
Net Cash Used in Investing Activities:	\$ M	\$ (7.1)	\$ (9.7)	\$ (15.9)	\$ (19.7)	\$ (25.6)	\$ (31.8)	\$ (38.0)	\$ (45.2)	\$ (52.6)
CASH FLOWS FROM FINANCING ACTIVITIES:										
New Equity Issued by Company:	\$ M	-	-	-	-	-	-	-	-	-
Net Cash Provided by Financing Activities:	\$ M	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Effect of Exchange Rate Fluctuations:	\$ M	5.0	(4.3)	6.1	10.1	6.3	7.7	9.1	10.4	11.6
Change in Cash and Cash Equivalents:	\$ M	14.9	12.4	15.1	36.0	24.9	32.1	34.9	39.2	41.0
Beginning Cash:	\$ M	5.1	20.0	32.4	47.5	83.5	108.4	140.6	175.5	214.7
Ending Cash:	\$ M	\$ 20.0	\$ 32.4	\$ 47.5	\$ 83.5	\$ 108.4	\$ 140.6	\$ 175.5	\$ 214.7	\$ 255.6

Which of the following conclusions might you draw from these projections?

- In this case, the Change in Working Capital boosts the company's cash flow because Current, Operational Liabilities are increasing by more than Current, Operational Assets.
- The company is generating significant excess cash flow and is not planning to return any of it to its investors.
- The company should be spending more on Capital Expenditures to use up its excess cash flow and build more value for its investors.
- Net Income is substantially different from Free Cash Flow, which indicates the company may be "playing games" with its Working Capital or CapEx.

11. Suppose that you are analyzing a high-growth software company, such as the one we have been using in these examples. This company, despite its high growth, also has high margins and is generating significant Free Cash Flow.

Which of the following answer choices represent the BEST ways for this company to spend its excess Free Cash Flow if it wants to maximize its valuation?

- a. Return capital to investors in the form of dividends or share repurchases, as doing so will likely boost the value of the company's shares.
- b. Substantially increase spending on Working Capital or Capital Expenditures, as both items are essential for software companies to grow.
- c. Spend more on sales & marketing to win bigger customers and boost the average customer value.
- d. Acquire related companies if the market is highly fragmented and there are target companies with reasonable valuations.

12. Assume that an investor is considering paying 110x EBITDA for a minority stake in this company as of the end of its last historical year. The sensitivity table below shows the investor’s expected IRR vs. the EBITDA exit multiple and the exit year:

Investor Returns - Internal Rate of Return (IRR):

		EBITDA Exit Multiple:							
		70.0 x	80.0 x	90.0 x	100.0 x	110.0 x	120.0 x	130.0 x	140.0 x
Exit Year:	FY 15	(25.2%)	(14.6%)	(3.9%)	6.8%	17.5%	28.2%	38.8%	49.5%
	FY 16	(6.3%)	0.2%	6.2%	12.0%	17.4%	22.7%	27.7%	32.5%
	FY 17	(0.9%)	3.6%	7.7%	11.6%	15.2%	18.6%	21.8%	24.8%
	FY 18	2.6%	6.1%	9.2%	12.1%	14.8%	17.4%	19.7%	22.0%
	FY 19	4.0%	6.8%	9.4%	11.7%	13.8%	15.8%	17.7%	19.5%

Based on this analysis, should the investor pay 110x EBITDA for a minority stake in this company?

- Yes – assuming the exit multiple stays in about the same range, the investor will likely earn between a 10% and 20% IRR.
- It depends on the IRR and the money-on-money multiple the investor is targeting.
- No – most growth equity investors aim for at least a 20% IRR on companies like this one, so the numbers don’t add up.
- It’s impossible to say because IRR is meaningless in a growth equity investing scenario; only the money-on-money multiples are useful.