Chapter 10

Financial Issues: Expectations, Modeling, and Scenarios

What's in this chapter:

- guidance and forecast construction
- revenue modeling
- EBITDA and free cash flow modeling
- debt structure
- scenarios
- a pragmatic point on bank maintenance covenants and expectations

HISTORICAL DATA IS very important to credit analysis, but an analyst has to develop a forward-looking analysis framework as well. This involves utilizing historical data to get an idea of what the company is capable of and which trends are likely to influence future performance. This forms the basis for developing an idea of what the company might look like going forward and whether the company is going to be better or weaker over time. The analyst can build a single model of what the future might look like for the credit, or a series of scenarios. As prediction is hard, scenarios are the better path when time permits.

Guidance and Forecast Construction

Many companies give guidance for a few selected metrics. This is often used as the basis of projections or scenarios. Company guidance is typically given for the next quarter or the next year or both. Companies with public stocks can be very sensitive about making sure they give guidance that they can beat or come very close to. For companies with public stock, there are also areas that provide a composite of sell-side equity analysts' earnings estimates. These are often called consensus estimates and can be viewed as a measure of how investor expectations might be set.

In the bank market, investors who choose to go private on a company can generally get three- to five-year projections from the company, but they are prohibited from sharing that information with others who are not private. They may also be prohibited from trading in the company's public bonds or stock. A company's guidance, or longer-term projections, serves as the basis from which an analyst can judge the company's performance and build a model, or set of scenarios. If guidance is available from a number of companies in the same industry, look to see if there are any meaningful differences in the trends they are outlining.

Most forecasting involves a certain amount of extrapolation from past performance and some insight into whether recent trends are going to be maintained, accelerate, decline, or reverse. Forecasting is often categorized as either bottom up or top down: it can come from the bottom up by building from expectations for each operational division within the company and expanding to look at overall company performance to see how that performance fits with industry expectations and how that industry fits into the outlook for the general economy. Top-down categorization starts with the overall economic picture and works down to specific revenue and expense drivers. In reality, forecasting should involve both macro and micro factors. The macroeconomic outlook will be more important for cyclical businesses and less so for more defensive businesses, but they are all intertwined.

When building a forecast, it is common to start with what drives revenue and then work down through expenses. Ideally, certain KPIs that would drive revenue should be identified. They could be data made available by the company or industry data. As an example, a software company may regularly

give updates on how many customers it has subscribed to its service. This could be used to derive a revenue model and build scenarios to see the sensitivity to changes in the customer count and changes in the average revenue per customer. Another example would be a company involved in the automotive space, where available industry and government data on total car sales can be used to build up a revenue model based on estimates of the company's market share.

Revenue Modeling

When building a model, ideally, there are certain items that drive revenue and expenses, such as units sold or contract renewals. Keep in mind that any model should be built so that it can be sustained over time. Choose inputs that can be obtained regularly, because the model should be updated as new data becomes available. For example, if there is a great data point that could be used to drive a model, but it only becomes available once every ten years, and another slightly weaker data point is updated every year, it is better to use the more frequently available one in the model. Rarely is the ideal information needed to build a model available. There will always be levels of uncertainty. Anyone doing credit analysis has to balance thoroughness and precision with timeliness and reality.

A decision has to be made as to how detailed to make the revenue model. For example, should there be a line item for every business division, or will it be enough to model the overall revenue? The level of detail for various line items may vary depending on what the biggest questions or concerns are surrounding the credit. If revenue is volatile and margins are more stable, it may be worth spending more time on the line items that build up revenue forecasts than on expense items.

One typical way to start building any model is from the top down by trying to derive which macro numbers influence revenue. It can start with GDP. However, often, data more specific to an industry can be gleaned. It can vary by industry and company. Often, specific projected data is available from companies, industry groups, or government entities. Do not underestimate the amount of data on government websites that have industry outlooks, and projections from government agencies and other organizations around the globe such as OPEC and the OECD.

After the key macro drivers are chosen, the next step is to figure out how those drivers impact revenue. One methodology would be to back-test relationships and go through results for the last several years to see how well correlated a company's revenue is to these macro factors. For example, historically, has the company's change in revenue moved in unison with changes in GDP or with computer sales?

It is also important to include any plans for expansion or divestiture that the company is undergoing. For example, in looking at a retailer, the model may use a consensus outlook for national consumer spending for the next year as a driver for that retailer's revenue expectations. However, if the retailer plans to build ten new stores a year, this expansion must be incorporated into the model as well. It might make sense to project sales per square foot for the retailer (this refers to square feet of selling space in the stores). As the company expands new stores, simply add more square feet to the model. It might look something like Exhibit 10.1.

Exhibit 10.1: Sample Model Driver

		A	B	C	D	E	F
		Year 1 Actual	**Year 2 Actual**	**Year 3 Actual**	**Year 4 Projected**	**Year 5 Projected**	**Year 6 Projected**
1	Consensus retails sales growth				1.00%	3.50%	1.00%
	Company Data						
2	Sales/ sq. ft. (in $)	420	418	421	425	440	444
3	Growth rate		-0.5%	0.7%	1.0%	3.5%	1.0%
4	Total retail sq. ft.	200,000	200,000	205,000	215,000	225,000	245,000
5	Total sales (in $)	84,000,000	83,600,000	86,305,000	91,420,150	99,020,779	108,900,852
6	Growth rate		-0.5%	3.2%	5.9%	8.3%	10.0%

In this simple example, columns A, B and C are historical results. The next three columns are projected estimates. This model is driven by sales per square foot, in line 2, and total retail square feet, in line 4. It assumes that the company's sales per square foot, or retail space, grow with the industry consensus and that the company grows its total sales (line 5) above the industry rate by adding square feet of retail space in the projected years. The first thing that someone with a healthy level of cynicism should notice is that the growth rates in the projected years are much higher than in the historical years. The main factors appear to be both higher growth in sales per square foot and more square feet owned by the company. This assumes that new retail space will capture as much revenue per square foot as existing retail space and thus implies that simply by adding square footage, the company can capture market share. This could be true, but it can be viewed as a fairly aggressive optimistic outlook.

There are more detailed aspects that could be added to the modeling. For example, there could be a breakdown of different components of the retail square footage by how much was dedicated to various products, or stores could be analyzed to see if they do better in some regions than in others. However, some of this data might not be available. An analyst could look at the historical data to see if this modeling concept would explain previous actual results.

There are simpler revenue modeling techniques. Rather than try to create a model with data that derives the revenue, such as in Exhibit 10.1, an analyst could take historical data and build projected revenue from the historical data. This could be as a simple as applying an anticipated industry growth rate to the most recent year, or just extrapolating future growth from the most recent period. If revenue has had a highly predictable growth pattern in the past, it might be easy to rationalize; but clearly, a situation could be oversimplified, especially if an industry is going through transition.

When preparing a financial model on a company that is entering a new operational phase, such as opening a new hotel or introducing a new product line, it can become harder to project revenue. Try to study similar projects undertaken by competitors to see how they evolved, how quickly revenue ramped, and where cost overruns occurred. Then, apply judgmental techniques to the size of project that is being undertaken at the company being analyzed.

For some companies, revenue mix can be a very important aspect of cash flow volatility. A company may have some high margin revenue lines and some lower margin revenue lines. Some sales may have a much longer selling cycle, and some much shorter. The business mix is important to consider when modeling both revenue and EBITDA.

Sales models can change, too, and this can impact the revenue. This is true of technology-driven fields such as mobile phone services, enterprise software, and the music industry; in all of these the revenue shifted from a product sales model to a subscriptions model. Changing sales models have to be considered when building out any projections. A shift in how products are sold, priced, or distributed can be very disruptive in the near term and increase the need for short-term cash, even if, in the long term, the plan seems sound.

Thoroughness versus Timeliness

Some analysts are modeling junkies. They build elaborately detailed and interconnected models. There are clearly times when this is necessary. But be careful not to spend too much time on elaborate models when a simpler one can give the same results. An analyst always must balance thoroughness against timeliness. A model should be easily adaptable so it can be used to react quickly to breaking news on a company. If a more elaborate and complex model is appropriate, it is wise to have a much simpler submodel that can be used and updated rapidly. Even the best analysis loses its value if the opportunity has passed and if the rationale and conclusions cannot be communicated coherently.

EBITDA and Free Cash Flow Modeling

The model in Exhibit 10.2 goes from revenue through expenses, EBITDA, free cash flow and then to modeling the important debt metrics and capitalization. This model uses a maker of car tires as an example. Columns B through D represent historical results. Columns E through G represent projections.

Exhibit 10.2: Actual and Projected Model Sample for a Tire Company (in 000,000s Unless Noted)

		A	B	C	D	E	F
		Year 1 Actual	Year 2 Actual	Year 3 Actual	Year 4 Projected	Year 5 Projected	Year 6 Projected
	Drivers						
1	Car sales	19	22	21	20	19	22
2	Inflation	1.00%	2.00%	1.00%	1.50%	1.50%	1.50%
3	Replacement units	15	14	15	15	15	15
4	New car units (mkt. shr. *4)	15	19	18	18	17	19
5	New car market share	20%	22%	22%	22%	22%	22%
6	Price per unit (in $)	30	30.343	30.499	30.75	31	31.25
7	Price growth		1.1%	0.5%	0.8%	0.8%	0.8%
	Income Statement Data						
8	Revenue	906	1,012	1,021	1,002	983	1,074
9	Revenue growth		11.7%	0.9%	-1.8%	-1.9%	9.2%
10	Cost of goods sold	589	668	679	677	669	736
11	Gross profit	317	344	342	325	314	338
12	Gross margin	35%	34%	34%	32%	32%	31%
13	Selling, general, and administrative	181	192	194	195	197	204
14	Depreciation	85	83	82	81	81	80
15	Operating income	51	69	66	49	37	54
16	Total interest expense	28	28	28	27	27	27
17	Cash taxes	9	15	14	8	4	10
18	EBITDA	136	152	148	130	117	134
19	Margin	15%	15%	15%	13%	12%	12%
	Free Cash Flow						
20	EBITDA	136	152	148	130	117	134
21	Capital expenditures	72	71	70	69	69	68
22	Interest expense	28	28	28	27	27	27

		A	B	C	D	E	F
		Year 1 Actual	Year 2 Actual	Year 3 Actual	Year 4 Projected	Year 5 Projected	Year 6 Projected
23	Cash taxes	9	15	14	8	4	10
24	Working capital uses	12	14	14	-5	12	15
25	Free cash flow	15	24	22	31	5	14
	Debt						
26	Bank debt (4%) due year 5*	300	300	290	280	270	270
27	Senior notes (8%) due year 6	200	200	200	200	200	200
28	Total debt	500	500	490	480	470	470
	Other Data						
29	Interest expense	28	28	28	27	27	27
30	Cash	20	44	66	98	103	117
	Credit Metrics						
31	EBITDA/total interest	4.9×	5.4×	5.3×	4.8×	4.3×	5.0×
32	Bank debt/ EBITDA	2.2×	2.0×	2.0×	2.1×	2.3×	2.0×
33	Total debt/EBITDA	3.7×	3.3×	3.3×	3.7×	4.0×	3.5×
34	Net debt/EBITDA	3.5×	3.0×	2.9×	2.9×	3.1×	2.6×
35	FCF/debt	3.00%	4.80%	4.60%	6.50%	1.40%	3.00%

* Amortization begins in year 3. This assumes the debt is refinanced at the end of year 5 at the same rate.

The macro drivers for the model include national car sales in line 1 and inflation in line 2. We assume these come from third-party sources, such as industry association or government historical data and projections. The sales are driven by replacement tires (line 3), which remain relatively constant, new car sales, and an estimate of the company's market share of tire sales for new cars. Revenue is simply driven by unit sales and price (line 3 + line 4 multiplied by line 6). Note that the price per unit, both historically and in the projected numbers, does not keep pace with inflation; the prices actually rise at only about half the rate of inflation.

Cost of goods sold is on line 10 and represents raw material and direct manufacturing costs. Line 13 has other operating expenses. The cost of goods sold should be impacted by the number of sales as well as inflation. This exhibit shows that cost of goods has been rising, and the model projects that it will rise more quickly than revenue, more in line with overall inflation, and this is causing gross profit margins to decline. Selling, General and Administrative (SG&A) expenses move along relatively consistently as a percentage of revenue.

It is usually not worthwhile to try to build a model of expenses with items that cannot be tracked in the future. If a company is not going to make certain detailed data on expenses available, it will likely not make sense to break it out in the model.

Even though companies do not usually break out costs into categories of fixed and variable, it is helpful to try to think of business expenses in this way. It is a good exercise to try to estimate the breakdown of expenses in this way, but it is hard to maintain a model based on this type of breakdown from the public documents typically available to an analyst.

When raw material inputs are part of the expenses, they can sometimes be modeled separately, such as crude oil for a refinery or paper costs for a printing plant. It is helpful to run scenarios with different commodity pricing environments. It is also helpful to factor in wage inflation and pension costs if applicable. Interest expense appears on line 22. It is derived from the debt capitalization. Usually, it is best to build a separate capitalization section of a model, run the interest expense from that section, and link it to the income statement. This model takes the average debt amount outstanding during a given year from lines 26 and 27. It multiplies the average amount outstanding by the respective interest rate for each tranche of debt and adds them together. Models can get more complex, particularly for floating-rate debt, and factor in scenarios with increasing or decreasing interest rates.

Starting on line 20, a section is set up to derive FCF. We start with EBITDA and then begin to subtract other selected cash uses. Capital expenditures are usually the most important item that needs to be included. Company management often gives guidance on these expenses, particularly if large projects are being undertaken.

A typical method of modeling capital expenditures is as a percentage of revenue. However, look at other factors. For example, if a company has been expanding or contracting its businesses, this could cause a shift in capital expenditures. Also, some types of capital expenditure can be lumpy, where very little has to be spent for several years, but then there is a large increase for the replacement of a major item.

Depreciation figures shift due to changes in capital expenditures, but also from adjustments for changes in tax accounting, write-ups, write-downs, or write-offs of asset value. It can be insightful to try to examine, over various periods of time, how well depreciations and capital expenditures are aligned. If they are materially different, try to understand why. It can give insights into the consistency and predictability of a company's capital investment. Mergers and acquisitions are often the cause of a mismatch between depreciation and amortization versus capital expenditures. Tax codes can also cause changes as they sometimes allow for companies to undertake acceleration of depreciation. The footnotes to the financial statements often discuss the useful life of the company's major assets, at least for accounting purposes. If capital expenditures are very low as a percentage of depreciation over time, it may be a sign that these expenditures need to spike suddenly. Similarly, if a major asset is nearing the end of its accounting useful life, explore whether there might be a pickup in capital spending.

When calculating FCF, always check if there is a difference in the interest expense reported on the income statement (total interest expense) and actual cash interest expense paid (cash interest expense). The latter is typically broken out on the statement of cash flows.

Cash taxes can usually be calculated based on a pretax net income figure when modeling FCF. However, many leveraged companies do not have to pay taxes if they do not generate pretax net income or because they have built up excess tax losses (net operating losses) that can be used to defer tax bills. So do not fall into the trap of assuming that a tax line on the income statement is actually a cash item. Always check the statement of cash flows and the footnotes.

Changes in working capital can also impact FCF. This can be hard to model going forward, and it is not something on which management always offers guidance. It is helpful to see how working capital has changed relative to revenue levels in the past and look at historical trends during various cycles.

Do not forget to explore the financial statement footnotes of a company to find details of pension obligations. While details may appear elsewhere in the statements, they are commonly set out in the footnotes. Pension-related expenses sometimes are large for companies with a legacy of a large employment base and may need to be modeled separately from other expenses.

Debt Structure

It is useful to build out a separate debt and liquidity portion of the model. In Exhibit 10.2 there is just a summary section on the debt, starting on line 26. The primary source of liquidity is cash, on line 30. In this model, the tire company generates positive FCF. A decision must be made as to what to do with the cash in the model. In this case, for the first two years of historical results in columns B and C, the company simply adds the FCF to its cash position. In year 3, in column D, bank amortization begins. Some FCF is used to pay down bank debt ($10 million), and then the balance is added to cash. Based on this historical pattern, the model assumes that the company will do the same in the projected years. Depending on what the covenants in the bank debt and bonds allow, the company could also deploy the cash for uses that are not as debt friendly. These uses could include buybacks of stock, dividend payments, minority investments in other companies, or acquisitions.

In the debt sections, break out each piece of the debt structure in as much detail as possible. Read through the footnotes or the separate exhibits that describe the debt instruments and note the maturities of debt and any scheduled principal amortization. It is recommended that a separate section in the model be set up, highlighting the debt amortization (debt paydown). This can be linked to the amount of debt outstanding so that these figures reduce in line with scheduled amortization. Generally, the more links the better, and it means fewer numbers have to change when new information arises, or it is decided to adjust scenarios. It is not uncommon for analysts to color-code entries that need to be regularly updated versus those that are linked and changed automatically.

In the model in Exhibit 10.2, the bank debt matures in year 5. An assumption has to be made about how this debt is paid off when it matures. This model assumes that the bank facility can be refinanced with a new loan at maturity. Debt is commonly not retired at maturity with cash that has been saved up for the repayment. More often, it is refinanced with a new debt instrument or

a combination of funding from debt and some other source such as cash on hand or asset sale proceeds. However, do not assume that a refinancing can automatically be accomplished. First, look at the leverage in the model at the time the debt matures. In this model, the debt is maturing in a year when car sales have declined, and margins have dropped for the tire company. This could make it more difficult to refinance. Looking at the bank leverage in Exhibit 10.2 at the time the current bank agreement matures and needs to be refinanced, the ratio is 2.3×; net of cash, it is about 1.4×. Based on those relatively low leverage ratios (the analyst could compare the leverage to other recently completed bank loans), this should give the analyst comfort about the ability to refinance this maturity. The next step will be to develop a view on the cost of refinancing. For example, in this case, given that the bank debt is being refinanced in a relatively weak operational year, would the banks demand a higher interest rate? It is likely that the banks would insist on a higher interest rate than the historical level. Include this in the model for the years after the refinancing, and this higher cost of debt will impact FCF. If the debt of a company is trading at a discount to par, it is a strong signal that when that debt comes due, the company will have to pay a higher interest rate because the market is already showing that to attract buyers of the debt, a higher rate than the stated coupon rate is required. If a debt instrument is very close to maturity and is trading at a discount, it may imply that the market thinks there is a high risk that the company cannot refinance the debt and may face default.

In this simple model, we have footnoted what the debt amortization is and what we assume happens in year 5, when the bank debt matures. Everyone who builds models should become a big fan of footnoting so that anyone looking at the model can determine the major assumptions that are being made. Some people prefer to have a separate section outlining assumptions being made in the model. Whichever method is preferred, any time the model is updated the assumptions and/or notes section needs to be too.

This model shows the cash line as a source of liquidity. In a more complex capitalization, there might be a section on other liquidity sources. Along with cash, there should be a line item for any other borrowings that are available. Most commonly, this is in the form of a bank revolver. However, there are other possible sources of liquidity, such as asset-backed lines and vendor financing. Any borrowings under the available facilities should be linked to the model's

debt section, and if these short-term borrowings go up or down, this should impact the interest expenses.

What happens if there is not enough cash or available borrowings to meet a required debt retirement, or perhaps the leverage is too high for a typical refinancing? The modeler would have to make some decisions about what the company could and would do. There are several ways this can be addressed in a model:

- *Funding needs*: The model can have a separate line, labeled either "Deficit" or "Funding Needs," that simply shows what the company needs to raise.
- *New financing*: You can assume that the debt can be refinanced and create a new line labeled "New Financing," making an assumption about whether it is in the bond or bank or even equity market. Then include the new debt and related expenses in the model going forward.
- *Financing options*: You can begin to explore the possibility of asset sales or unconventional financing options.
- *Scenarios*: You can assume that this is a trigger for a default and/or a major asset sale and start to run scenarios for restructuring.

The bottom line is that when there is a shortfall to meet an obligation in a model, the analyst must begin thinking about options for the company and what the possible outcomesmight be for the holder of a bond or bank loan in the company. In these cases, it is vital to start running scenarios and considering decision trees with various probabilities for different outcomes.

You can build models in a multitude of ways. It is important to remember that sometimes models vary depending on what the analysis is trying to solve. For example, suppose the company being analyzed is doing well and the focus is on how quickly it can deleverage and get a rating agency upgrade. In this case, a model could be built to show FCF going to pay down debt as rapidly as possible. In another example, a company may have a number of debt maturities coming up and not have the cash to meet them. The analyst may be more interested in how much cash can be built up and in analyzing which avenues might be available for new financings. This might include looking at the bank covenants and determining if there is room within the bank agreement to raise more borrowing, or which assets outside the lending group might be available to sell or securitize.

Avoid Extrapolation

One of the biggest dangers in building any model is becoming too dependent on extrapolation from historical trends. When building models, don't just automatically assume that the conditions of the recent past will continue. It is rare to see a company that is not facing major changes either due to changes in the macroeconomic environment, a shifting competitive landscape in its industry, or internal operational changes. An analyst wants to learn from the past and look for operational trends, but simple extrapolation from the past will not prove helpful without layering in some careful thought about how a business is likely to change in the future.

Scenarios

With many variables in a model, minor changes in one or two assumptions can alter a company's outlook, especially over a longer time period. Therefore, rather than building a single model and using that as an ideal projection or estimate, it is often preferable to look at a few scenarios to analyze how sensitive a company's credit quality may be to different operational conditions.

You might want to build scenarios to solve to a given event and see if they look realistic. If a bond issuer is a candidate for an upgrade to investment-grade, instead of building one model that estimates cash flow and leverage, the drivers of the model could be reversed. The model could be run to see how much deleveraging would have to occur for an upgrade and if that could be reasonably achieved over a given time period. In a more stressed credit, the model could be designed to see how much of an EBITDA decline has to occur for a company to see its FCF go negative and figure out if that level of decline is realistic. Or the model could simply run financials assuming various business trends to see how the company performs during a recession, during a raw materials price increase, or in a growth scenario. Then two different companies can be compared to see how well they do in each of these scenarios.

Good scenario analysis can apply a probability to each case, and this makes it easy to develop a probability-weighted outcome. In a developing situation, the use of scenarios has an advantage over a single estimate. The use of scenarios,

probabilities, and a probability-weighted estimate allows the modeler to make changes to both the scenarios and the probabilities, as new information becomes available. This can be particularly helpful in stressed situations and contentious merger and acquisition transactions.

In the simplest scenario analysis, an analyst could run a base case with a downside and an upside scenario. Exhibit 10.3 takes our tire company model, looks at the projected years, and reduces EBITDA by 10%. In this case, it appears that the FCF and the EBITDA/interest expense ratio are the metrics most sensitive to the decline.

Exhibit 10.3: Scenarios Down 10% (In $000,000s Except for Metrics)

	E	F	G
	Projected Year 4	**Projected Year 5**	**Projected Year 6**
EBITDA	117	106	120
Margin	12%	11%	11%
Free Cash Flow			
EBITDA	117	106	121
Capital expenditures	69	69	68
Interest expense	27	27	27
Cash taxes	8	4	10
Working capital uses	(5)	12	15
Free cash flow	18	(5)	1
Debt			
Bank debt (4%) due year 5*	280	270	270
Senior notes (8%) due year 6	200	200	200
Total debt	480	470	470
Other Data			
Interest expense	27	27	27
Cash	84	79	80
Credit Metrics			
EBITDA/total interest	4.3×	3.9×	4.5×
Bank debt/EBITDA	2.4×	2.5×	2.2×
Total debt/EBITDA	4.1×	4.4×	3.9×
Net debt/EBITDA	3.4×	3.7×	3.2×
FCF/debt	4%	-1%	0%

*Assumes this debt is refinanced at the end of year 5 at a comparable interest rate.

Exhibits 10.4 through 10.6 show a very simple scenario analysis for a company's projected operating income. Exhibit 10.4 shows the most recent historical results for the company, which will be the base for the projections. The revenue drivers in this model are for units sold, multiplied by price per unit. In this simplified example, the expenses are made up of two items: 1) the cost of goods sold (COGS), which is also driven by being multiplied by units sold, and 2) other expenses, which are less variable than COGS. In Exhibit 10.5, the assumptions for each scenario are laid out and should be linked to the model so if changes in assumptions are made, they roll through the scenarios. Exhibit 10.6 shows three years of projections for each scenario. It can be seen that the year 3 operating income varies materially in all three cases.

Exhibit 10.4: Historical Result for Scenario Analysis of Operating Income

Historical	
Units sold	500,000
Price per unit	1,000
COGS per unit	350
Income Statement in $000s	
Revenue	500,000
COGS	175,000
Gross profit	325,000
Gross margin	65%
Other expenses	200,000
Operating inc.	125,000

Exhibit 10.5: Scenario Assumptions

Change in Units Sold	
Scenario 1	3.0%
Scenario 2	-3.0%
Scenario 3	10.0%

Change in Price of Average Units Sold	
Scenario 1	3.0%
Scenario 2	-3.0%
Scenorio 3	10.0%

Cost of Goods Sold Inflation Rate	
Scenario 1	0.8%
Scenario 2	1.5%
Scenario 3	3.0%

Cost of Other Expenses Inflation Rate	
Scenario 1	0.6%
Scenario 2	1.0%
Scenario 3	1.2%

Exhibit 10.6: Three Scenarios for Year 3 Operating Income

	Scenario 1			Scenario 2			Scenario 3		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Units Sold	515,000	530,450	546,364	485,000	470,450	456,337	550,000	605,000	665,500
Price per Unit $s	1,030	1,061	1,093	970	941	913	1,100	1,210	1,331
COGS Per Unit $s	353	355	358	355	361	366	361	371	382
Income Statement Date in $000s									
Revenue	530,450	562,807	597,176	470,450	442,693	416,636	605,000	732,050	885,781
COGS	181,795	188,310	195,598	172,175	169,832	167,019	198,550	224,455	254,221
Gross Profit	348,655	374,498	401,578	298,275	272,861	249,616	406,450	507,595	631,560
Gross Margin	66%	67%	67%	63%	62%	60%	67%	69%	71%
Other Expenses	201,200	201,200	201,200	201,200	201,200	201,200	201,200	201,200	201,200
Operating Inc.	147,455	173,298	200,378	97,075	71,661	48,416	205,250	306,395	430,360

Each of these scenarios show very different operating income in year 3. It is also not likely that all of these outcomes have an equal probability of occurring. More likely, scenario 1 is a base case outlook, while scenario 2 is a downside case, and scenario 3 is a more positive case. Therefore, it would appear worthwhile for the analyst to apply a probability to each outcome. In Exhibit 10.7, a probability is assigned to each scenario and multiplied by that scenario's year 3 operating income. When these products are added together, the analyst will have a probability-weighted year 3 operating income to utilize in future analysis. For this to work, the probabilities need to total 100% when added together. The spreadsheet in Exhibit 10.7 totals all the probabilities as a check that the analysis is complete.

Exhibit 10.7: Probability-Weighted Year 3 Operating Income

	A	B	C
	Probability	Year 3 Op. Inc.	A × B
Scenario 1	60%	197,842	118,705
Scenario 2	20%	43,412	8,682
Scenario 3	20%	423,970	84,794
Total	100%		212,182

Scenario Paralysis

While scenarios are exceptionally valuable as an analytical tool, they can also become a time-wasting labyrinth if they are taken too far. An endless number of scenarios can be run on any situation, so the analyst has to be very conscious of building too many scenarios that have only minor changes and do not really help to answer the concerns about the situation. Careful planning should be undertaken before building out scenarios, and the scenarios chosen should show some meaningful differences and have a realistic chance of occurring.

A Pragmatic Point on Bank Maintenance Covenants and Expectations

Bank loans sometimes have maintenance covenants, such as minimum EBITDA/interest ratios or maximum leverage ratios. These are normally expected to show improvement over time. It is useful when building estimates, or scenarios, to include them in the model's ratio section to see how much headroom, or cushion, is anticipated from the expected results relative to these covenanted maintenance tests in each scenario. A violation or potential violation of these covenants certainly is an event that needs to be noted, as it will generally trigger a negotiation between the company and the bank lenders.

The maintenance tests are usually based on company projections that both the company and the banks are comfortable with. The covenants might typically be designed to give headroom of 25% over these projections, or less in stressed situations. This can sometimes be used as a roadmap for public analysts to ascertain the company's internal projections.

Keep in mind that the measures used in the loan document, such as an EBITDA minimum level, may be a carefully defined term and may differ from how the model may be calculating the data. For example, in the covenant leverage ratio, the definition may allow add-backs of one-time cash charges to EBITDA and allow cash to be counted against total debt. In this case, it is good to have separate lines in the model for covenant EBITDA and covenant debt.

Even when there are no maintenance tests in the debt documents, it can make sense to include a covenant calculation in a model. A common item to monitor is how much room a company might have under its restricted payments covenant limiting its ability to pay dividends. An estimate can be run, in the model, of how much capacity the company has, based on the covenants and the definitions in the loan documents.

Another item to keep in mind is expectations. In stock market commentary, when a company releases earnings, there is often much focus on whether the company met consensus expectations of analysts' estimates. The stock may frequently trade up or down, based on how well the company did versus these expectations. The leveraged finance market typically does not have the same degree of sensitivity, but the movements and reaction in the equity market can be a valuable gauge for sentiment. Therefore, for short-term trading around earnings, a credit analyst should try to have a good understanding of the expectations for quarterly results. If there is a significant reaction upon the release of results, it should be analyzed to determine if it will have a short-term or long-term impact on the debt securities, because sometimes, when there is a surprise result, the markets over-react, initially.

Closing Comment

The development of models showing what the credit quality of a company is likely to be in the future is a very important part of credit analysis. These models are rarely a perfect predictor of the future, but they are a valuable tool and should be revised as new operational trends evolve. They help investors understand which operational changes can trigger the biggest changes to the credit quality of a debt issuer. Scenario analysis is generally more useful than building out just one model, as long as some real thought is put into the analysis and the probabilities. The next level of scenario analysis would apply an expected value to the related debt instruments in each scenario to estimate where the debt instruments might trade in each scenario.