**Nine major categories of the income statement**

1. Revenue (Sales) – important to know when and how revenue is recognized
2. Cost of goods sold (COGS)– direct costs related to the production of goods sold by a company
3. Operating expenses – incurred by performing normal business operations
   1. Selling, general, and administrative (SG&A)
   2. Advertising and marketing
   3. Research and development (R&D)
4. Other income – generated from non-core parts of the business
   1. since this income is taxable it has to be recorded
   2. income from non-controlling interests (a.k.a. income from unconsolidated affiliates)
   3. whether to include in EBITDA depends on several things such as: is it core enough to the operations, is it consistent and reoccurring, the purpose of the analysis, how other companies treat it for purposes of comparison, is the treatment defensible
5. Depreciation and amortization (D&A) – accounts for the aging and depletion of fixed assets over time; amortization accounts for the cost basis reduction of intangible assets such as intellectual property (patents, copyrights, trademarks, etc…)
6. Interest – net of interest received on cash and cash equivalents less interest paid of debt
7. Taxes – financial charges imposed by government on a company’s earnings before taxes
8. Non-recurring and extraordinary items (non-recurring items) – expenses or income that are either one-time or not pertaining to core operations. These items should be identified and moved below the EBITDA, EBIT, and NI line items in order to derive “clean” EBITDA, EBIT, and NI.
9. Distributions – broadly defined as payments to equity holders (usually in the form of dividends and / or non-controlling interest payments

These major categories are important to dissect because they are the drivers of profitability and also the basis for comparing profitability between different companies to derive relative valuation.

Moving non-recurring items to a separate section results in an adjusted net income that does not equal to net income (as reported). Therefore, a second net income line that reconciles the adjusted net income with adjustments to arrive at net income (as reported) should also be included in the analysis. Additionally, when net income is being compared between different companies, it’s important to ensure that net income is consistently defined across all companies in the comparison.

***Tip***: Hardcoded numbers in a model should be in blue font. All formulas should be in black font.

***Tip***: It is worth doing a quick word search on “expense” or “operating expense” in the 10K to see if there is a more detailed table listing individual expenses.

We’ll discuss later on how calculating an expense as a percentage of revenue may or may not be a good indicator of future performance.

**Digging up depreciation**

Not all companies list depreciation as a separate line item. In those situations, start by doing a word search on “depreciation” and also check the cash flow statement. Note that depreciation amounts can differ between the various financial statements.

When depreciation is not explicitly broken out in the income statement, it is usually buried in one of the expense items elsewhere in the income statement. Search on “depreciation” can help when trying to figure this out. Oftentimes depreciation is rolled up into COGS and/or SG&A. Regardless of how it is distributed, the EBITDA is unaffected.

**Income Statement – Making Projections**

One needs to spend much time understanding and researching the core business model, how the company generates revenue, its cost structure, and beyond in efforts to estimate next year’s performance as best as possible.

A good model is a functional and flexible one, and is one that is designed to easily be adjusted, to grow, and to evolve as we gain more knowledge and insight into the inner workings of the business as we hone in on a perfect valuation. It is important to remember not to depend on any one single source of information. It is not safe to make the general assumption that last year’s growth will equal this year’s or next year’s growth.

**Projecting Revenue**

Focus on understanding the company’s pricing and volume. Research includes:

* what initiatives is the company taking to increase its volume?
* is it increasing advertising?
* is it acquiring other businesses or customers?
* what outside forces could affect the company’s pricing model (Porter’s five forces)?
* is it increasing pricing?
* is it facing competition and how is this competition affecting its pricing and volume?

Valuable sources of additional research include:

* investor presentation – contain high-level projections
* earnings calls – management speaks about the company’s most recent financial performance and sometimes management gives guidance on the company’s future performance
* Wall Street research
* Data sources – find some that contain consensus estimates such as consensus revenue; it is important to note the range and mean of these consensus estimates

It is up to you to decide how detailed you would like your analysis to be. In many cases, revenue can be broken out by product, volume, and even geography. It is also not uncommon to have a completely separate revenue schedule and analysis that will feed into the income statement.

**Projecting COGS**

It is important to consider whether costs are fixed or variable. A fixed cost is relatively static and independent of revenue growth and may grow a certain percentage year over year. A variable cost will change in direct proportion to the growth of the business, most commonly determined by revenue growth. There are, however, exceptions. For example, a revenue increase could be due to an increase in pricing and not due to volume and hence this would not impact COGS. However, if product price increases are being driven by input price increases, then COGS would be increasing. This is why a deeper understanding of the company’s business model and cost structure comes in handy.

Historical trends can help us determine how best to make initial projections. For example, if historical COGS % of sales has remained consistent over time, this is a strong indicator that COGS is dominated by variable costs and growing at the same rate as revenue. Conversely, if COGS % of sales has not been consistent, further research would need to be done to better understand the reasons for this variability.

There are several methods for making an initial projection:

* take an average percentage of the last three years
* take the maximum percentage of the last three years (conservative)
* take the minimum percentage of the last three years (aggressive)
* take last year’s percentage (naïve)
* have the percentages steadily increase or decrease year over year.

**Projecting OpEx**

The same process and considerations that were applied to projecting COGS and be applied to projecting OpEx. Generally speaking, if you bake in aggressive assumptions, you should only do so if there is compelling evidence to support an aggressive view.

**Projecting D&A, Net Interest, Taxes**

When building a complete financial model it is recommended to leave projected depreciation empty for now since we will be building a depreciation schedule that will contain projected depreciation expense that will feed into the income statement projections. This also applied to the net interest section.

For tax projections, you can choose from one of the projection methods discussed previously. However it is a good idea to do a word search of “tax”, “taxes”, etc… to see if there is direct guidance on the future tax rate.

Note that quite often a company will state a reported tax rate that is different than what has been calculated. This difference could be due to adjustments made to pretax net income or other tax benefits realized. In such cases one can either take the historical percentage or the reported rate. One must also make the determination if those adjustments would continue to happen in the future or if the company would pay taxes based on the standard rate.

**Projecting Non-Recurring Events**

Typically we don’t project non-recurring items because typically they will not exist in the future or will not be core to our valuation. However, there may be some additional analyses where a deeper understanding of non-recurring events is necessary.

**Projecting Non-Controlling Interest**

Typically assessed as a percentage of net income. Since non-controlling interest is a payout based on total ownership, it would make more logical sense to use the last year’s approach as the best indicator for next year’s estimates, unless further research reveals reason for the level of ownership to change.

**Basic Shares Outstanding**

The most recent 10Q has the most up-to-date basic shares outstanding. This number can be used as the estimate for future basic shares outstanding.

**Diluted Shares Outstanding**

There are several resources for obtaining the total number of diluted shares. The best way is to calculate the number ourselves. The start point is the most recent annual report (note that the most recent 10Q usually does not contain the options and warrants detail). In the annual report, search on “options” to find disclosures related to options and warrants. Several variables have to be considered including: the total number of outstanding options and warrants, the stock price relative to the exercise price, whether there are restrictions, such as timing, that prevent exercise of the option.

Once you have honed in on the total exercisable options, multiply that number at the strike price. This product yields the total value of the exercise. Apply a common method called the treasury method, which states that the exercised options are bought back at the current stock price. Using the treasury method, the total value of exercise divided by the current stock price yields the number of shares bought back. The difference between the exercisable shares and the shares bought back results in the total increase in the shares outstanding. Adding this increase to the basic shares outstanding results in the diluted shares.

It is important to be thorough in making sure all stock options, employee stock options, and warrants are accounted for. These may be spread across several tables and any additional filings may contain announcements about issuance of options or warrants not captured in the annual and/or quarter filings.

**Chapter 1 Key Formulas**

**General Concepts**

The total measure of how much cash is generated or has been spent over a given period equals the sum of cash from operating activities plus cash from investing activities plus cash from financing activities.

**Cash from Operating Activities**

Cash from operating activities represents how much cash was generated from net income or profit. The goal is to adjust net income for non-cash changes in income statement line items. These adjustments can be categorized as follows:

**Revenue** – the portion of revenue received on credit is called ***accounts receivable***.

**COGS** – is the inventory costs related to items sold and inventory expenses made on credit or ***accounts payable***.

**Operating expenses** – the portion of operating expenses that has not been paid is called ***accrued expenses*** as well as ***prepaid expenses***.

**Depreciation** – is an expense that is never actually paid and we add it back to net income.

**Interest** – is almost always paid in cash.

**Taxes** – the portion of taxes that we expensed but did not yet pay is called ***deferred taxes***.

**Cash from Investing Activities**

Cash from investing activities is cash generated or spent from buying or selling assets, businesses, or other investments and/or securities. The major categories are:

* Capital expenditures for investments in property, plant, and equipment. CAPEX are important for valuation in discounted cash flow analysis.
* Buying or selling assets
* Buying, selling, spinning off, or splitting businesses or portions of business entities
* Investing in or selling marketable and non-marketable securities
* Other investing activities often is not clearly defined, but it certainly needs to be included

**Cash from Financing Activities**

Cash from financing activities is cash generated or spent from equity or debt. The major categories are:

* Raising or buying back equity of preferred securities. It is important to note the difference between buying securities of other companies (investing activity) and buying back securities of its own company (financing activity).
* Raising or paying back debt. It will be much simpler to combine issuances and payments of like debt instruments. Payment of capital lease obligations is treated as payment of debt.
* Distribution to equity holders (non-controlling interests and dividends)

**Cash Flow Statement – Making Projections**

When making projections, many cash flow statement line items come from the depreciation schedule, working capital schedule, or debt schedule. It is often recommended to complete the depreciation and working capital schedules first. The debt schedule should always be done last.

The seven methods of projections:

1. Minimum of the past three years (conservative)
2. Maximum of the past three years (aggressive)
3. Average of the past three years (average) – does not always give the best indication of next year’s performance especially if one of the past three years was unusual.
4. Last year (recent) – combining this method and the conservative method is a useful indicator. If last year’s performance also happens to be the most conservative of the last three years, then we have two supporting methodologies that point to the same number. The more support we have, the better.
5. Repeat the cycle (cyclical) – companies can make larger capital expenditure investments every third year (for example) and smaller investment in between years. In this sort of situation, the cyclical method can be appropriate.
6. Year-over-year growth (growth) – looking at trends is helpful when choosing this method.
7. Project out as a percentage of an income statement or balance sheet line item (percentage). This method is useful when a line item grows dependent on another income statement or balance sheet line item. For example, if “other” is made up of employee salaries, you may want to project this line item based on a percentage of SG&A. A helpful analysis would be to examine if the historical percentage of SG&A has been fairly consistent.

These are similar to the five methods mentioned in Chapter 1. However, the methods in Chapter 1 were relating to projecting variable operating expenses driven by revenue generation, so we had a better idea of their nature. These more complete seven methods apply to projecting all, including more obscure, line items.

When figuring out what method to choose, its important to understand the context in which they apply. There is a laddered approach to selecting the best method.

**Cash Flow from Operating Activities – Making Projections**

It is critical to ensure that we are pulling the correct net income from the income statement. Generally, you should always select net income before distributions (dividends, non-controlling interests).

A good analyst should always adds explicit detail and explanations to assumptions to the model. It is important to note that quite often “other” items are insignificant to the overall valuation. Trying various methods on “other operating activities” and observing the impact on the valuation is an important form of scenario and stress testing. If different methods result in varying valuation, then researching other operating activities in greater detail is highly recommended.

**Cash Flow from Investing Activities – Making Projections**

**CAPEX** is one of the few items that management often gives guidance on and this can be dug up with a word search in the annual report. Projecting CAPEX as a percentage of sales is often considered too aggressive. It is important to gauge the company’s position in the business cycle. For example, if a manufacturer has a lot of spare capacity coming out of a downturn, it would make sense to maintain CAPEX levels at historical levels until capacity reverted to normal pre-downturn levels.

Despite the cautionary note of CAPEX as a percentage of sales, this method is a good starting point. We should observe the historical trend in the calculation and also note if there are any aberrations that should be taken into account.

**Proceeds from disposal of property and equipment** is very difficult to project. It can be a function of selling off PP&E due to normal business wear-and-tear or selling off PP&E associated with businesses they have closed or are planning on closing. In any case company guidance and/or subsequent quarterly reports can provide useful insights into making better projections for this line item. When we lack any further insights, the conservative approach of hardcoding zeros is preferred.

**Items based on cash available** such as purchasing securities and buying back its shares are not necessarily critical to driving operations. When a company does not have sufficient cash on hand, these activities may not be the best or most feasible business decisions. These items are almost impossible to predict and it is a good idea to revisit once the model is completed and we have a better grasp on the company’s cash position. It is also important to do further research and listen to the company’s latest conference call to see if cash management or future cash initiatives are discussed.

Acquisition of businesses, net of cash acquired is another important item based on cash available. Analysts always need to step back and research such line items in addition to selecting one of the earlier projection methods. In the initial model, leaving this line item projected as zero is a good idea.

We will see that CAPEX is most often the investing activities line item that is most impactful to our valuation. Therefore, although an item such as acquisition of business can be highly volatile and difficult to predict it is helpful to know that such items are also not the most impactful to the overall valuation.

**Other investing activities** is oftentimes unclear but also oftentimes not impactful to the overall valuation. Therefore, using a conservative projection method is preferred.

**Cash Flow from Financing Activities – Making Projections**

**Dividends** can be projected based on $/share. The $/share is typically disclosed in the annual report. If it is not disclosed then historical dividends can be divided by historical shares to derive an implied $/share.

Its preferable in the initial model to keep subsequent years’ $/share constant until we uncover concrete evidence from management that a change in the dividend policy will in fact happen. Note that dividends are commonly reported on a company’s income statement in the “distribution” section and removed from net income. This suggest extra care when linking net income from the income statement to the starting point of the cash flow statement is needed.

**Purchase of common stock** is a share buyback in which cash is spent and the number of outstanding shares in the market is therefore reduced. It can be considered an item based on cash available. One of the major reasons a company will buy back shares is to try to increase the value of its stock price through the forces of supply and demand. This does not always end up holding true based on other external market forces.

If we project share buybacks, we need to assume the share count will continue to decrease. This adjustment should be made in the income statement as a reduction in basic and diluted shares.

**Chapter 2 Key Formulas**

The reduction in asset value due to depreciation can be expensed. If an item is expensed, net income is reduced after taxes are taken into account, which in turn will reduce the retained earnings in the shareholder’s equity section of the balance sheet.

The two common categories of depreciation are 1) straight line and 2) accelerated.

**Accelerated Depreciation**

The most common reason for accelerating depreciation is that a higher depreciation expense will produce a lower taxable net income and therefore lower taxes.

The three most common methods are:

1. declining balance – depreciation rate is applied for previous years cost basis
2. sum of years’ digits – depreciation rate is applied to the based value of the asset
3. modified accelerated cost recovery system (MACRS) – is the US tax method of depreciation. MACRS is a predefined set of percentages (applied to the base value of the asset, these rates can be found on www.irs.gov) determined by the asset’s useful life and when the asset is placed in service (half-year, mid-quarter). Since asset placement is most likely unobtainable, mid-first quarter is most commonly used for modeling purposes.

Note that quite often there are differences between the income statement reported for GAAP purposes and for tax purposes. One of the major difference is attributable to the depreciation method used. For GAAP, straight line, declining balance and sum of years’ digits can be used with straight line being most commonly used. For tax accounting MACRS is used. The difference in the net income resulting from different depreciation methods generates a **deferred tax liability**.

**Deferred Tax Asset**

A deferred tax asset is defined as an asset on a company’s balance sheet that may be used to reduce income tax expense. A deferred tax asset is most commonly created after incurring a net operating loss (NOL). An NOL can be carried back two to five years or carried forward up to 20 years. The range of years depends on several business factors that the IRS considers on a case-by-case basis. An NOL becomes a balance from which taxers can be deducted in other years.

**Deferred Tax Liability**

A deferred tax liability is caused by temporary accounting differences between GAAP and tax income statements. The difference between reported taxes (GAAP) and taxes paid becomes a non-cash item. Just like any expense that we did not yet pay in cash, this non-cash portion of taxes is added back to net income in the cash flow statement and is accounted for as a deferred tax liability.

**Projecting Depreciation for GAAP**

We need to consider depreciation on both the assets the company currently owns and its future property improvements that it is projecting to build (CAPEX).

We begin with the net value of its assets. This is predominantly in the form of net PP&E. Another component is *property under capital lease, net*. We may want to include this item but it may depend on whether a company includes this item in its total depreciation and amortization expense. A word search on “capital lease” or “leasehold” can help dig this up quickly.

Projecting depreciation is difficult in any exact sense because companies report PP&E as a combination of many different asset classes with different useful lives. Furthermore, when these assets are individual placed into service is rarely available. Hence, the next best method is to analyze the historical depreciation trend and use this as a barometer for the reasonableness of your projection.

We will project GAAP depreciation using straight line with a useful life assumption. We can then tweak the assumption to such that the projected depreciation comes in line with the historical trend. Note that it is unusual to see huge drops or increases in depreciation. Huge drops can occur when a company has written down assets or sold assets or a large portion of its assets have been fully depreciated. Conversely, huge increases in depreciation can occur when a company has purchased a business or assets. With that noted, we should do some research to ensure there have not been any such significant events to the company’s assets.

We have already projected CAPEX in the cash flow statement. Therefore, we can use the cash flow statement projections and link them into the depreciation schedule.

When PP&E, CAPEX, and any other depreciated and amortized assets have been accounted for on a GAAP basis, the total GAAP depreciation and amortization expense is the sum of these separate components. Once this sum is computed, we can analyze how this total compare to the historical depreciation and forward looking depreciation trend projection.

Unless there have been major write-downs or divestitures or investing activities, we should continue so see a persistence in the depreciation trend. In this situation if our projected depreciation falls significantly outside the depreciation trend projection, then we adjust the useful life estimates of the various components such that the projected depreciation falls within the trend depreciation range.

**Projecting Depreciation for Taxes**

MACRS has to be used to accelerate depreciation for US tax purposes. The by-product of accelerating depreciation is that a deferred tax liability is created. Because companies can have so many subsidiaries in various geographic locations, there is no one simple method of creating a deferred tax liability.