THE LITTLE BOOK OF VALUATION

How to Value a Company, Pick a Stock, and Profit

by Aswath Damodaran

Book Summary

Chapter-by-chapter summary of the key takeaways derived from the book.

The book is available for purchase from Amazon **HERE**

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Chapter 1 – Understanding

Ultimately, there are dozens of valuation models but only two valuation approaches: intrinsic and relative. In intrinsic valuation, we begin with a simple proposition: The intrinsic value of an asset is determined by the cash flows you expect that asset to generate over its life and how uncertain you feel about these cash flows. Assets with high and stable cash flows should be worth more than assets with low and volatile cash flows.

In relative valuation, assets are valued by looking at how the market prices similar assets. Thus, when determining what to pay for a house, you would look at what similar houses in the neighbourhood sold for. With a stock, that means comparing its pricing to similar stocks, usually in its "peer group."

Intrinsic valuation provides a fuller picture of what drives the value of a business or stock, but there are times when relative valuation will yield a more realistic estimate of value. In general, there is no reason to choose one over the other since nothing stops you from using both on the same investment. In truth, you can improve your odds by investing in stocks that are undervalued not only on an intrinsic basis but also on a relative one.

Bias

All too often, your views on a company or stock are formed before you start inputting the numbers into the models and metrics that you use and, not surprisingly, your conclusions tend to reflect your biases.

Always be honest about your biases: Why did you pick this company to value? Do you like or dislike the company's management? Do you already own stock in the company? Put these biases down on paper, if possible, before you start. In addition, confine your background research on the company to information sources rather than opinion sources; in other words, spend more time looking at a company's financial statements than reading equity research reports about the company.

Uncertainty

Most valuations (even good ones) are wrong.

Collecting more information and doing more analysis will not necessarily translate into less uncertainty. In some cases, ironically, it can generate more uncertainty.

When valuing an asset, use the simplest model that you can. If you can value an asset with three inputs, don't use five. If you can value a company with three years of forecasting, forecasting 10 years of cash flows is asking for trouble. Less is more.

Chapter 2 – Time Value, Risk, and Statistics

Time Value of Money

There are three reasons why a cash flow in the future is worth less than a similar cash flow today.

1. People prefer consuming today to consuming in the future
2. Inflation decreases the purchasing power of cash over time. A dollar in the future will buy less than a dollar would today.
3. A promised cash flow in the future may not be delivered. There is risk in waiting.

The process by which future cash flows are adjusted to reflect these factors is reflected in the discount rate. The discount rate can be viewed as a composite of the expected real return (reflecting consumption preferences), expected inflation (to capture the purchasing power of the cash flow), and a premium for uncertainty associated with the cash flow.

The present value of a cash flow is calculated thus:

$$\frac{Cash\ Flow\ in\ Future\ Period}{(1 + Discount\ Rate)^{Time\ Period}}$$

A growing perpetuity is a cash flow that is expected to grow at a constant rate forever. The present value of a growing perpetuity can be written as:

$$\frac{Expected\ Cash\ Flow\ Next\ Year}{(Discount\ Rate - Expected\ Growth\ Rate)}$$

Although a growing perpetuity and a growing annuity share several features, the fact that a growing perpetuity lasts forever puts constrains on the growth rate. The growth rate has to be less than the discount rate for the equation to work, but an even tighter constraint is that the growth rate used has to be lower than the nominal growth rate of the economy, since no asset can have cash flows growing faster than that rate forever.

Financial Metrics and Ratios

To measure profitability on a relative basis, you can scale profits to revenues to estimate margins, both from an operating standpoint (operating margin = operating income/sales) and to equity investors (net margin = net income/sales).

To measure how well a firm is investing its capital, we can look at the after tax operating income relative to the capital invested in the firm, where capital is defined as the sum of book values (BV) of the debt and equity, net of cash, and marketable securities. This is the return on capital (ROC), or return on invested capital (ROIC) and it is computed as follows:

$$After\ Tax\ ROC = \frac{Operating\ Income\ (1 - Tax\ Rate)}{BV\ of\ Debt + BV\ of\ Equity - Cash}$$

Return on equity (ROE) examines profitability from the prospective of the equity investors by relating profits to the equity investor (net profit after taxes and interest expense) to the book value of the equity investment and can be computed as:

$$ROE = \frac{Net\ Income}{Book\ Value\ of\ Common\ Equity}$$

Chapter 3 – Determining Intrinsic Value

There are four basic inputs that we need for a value estimate: cash flows from existing assets (net of reinvestment needs and taxes); expected growth in these cash flows for a forecast period; the cost of financing the assets; and an estimate of what the firm will be worth at the end of the forecast period.

Cash Flows

Free cash flow measures the cash left over after taxes, reinvestments needs, and debt cash flows have been met.

Net Income to Free Cash Flow Calculation	
Net Income	Earnings to equity investors, after taxes and interest expenses.
+ Depreciation	Accounting expense (reduced earnings), but not a cash expense.
- **Capital Expenditures**	Not an account expense, but still a cash outflow.
- **Change in Non-Cash Working Capital**	Increases in inventory and accounts receivable reduce cash flows and increases in accounts payable increase cash flows. If working capital increases, cash flow decreases.
- **(Principal Repaid – New Debt Issues)**	Principal repayments are cash outflows, but new debt generates cash inflows. The net change affects cash flows.
= Free Cash Flow	This is the cash left over after all needs are met. If it is positive, it represents a potential dividend. If it is negative, it is a cash shortfall that has to be covered with new equity infusion.

A more conservative version of free cash flows, which Warren Buffett calls "Owner's Earnings", ignores the net cash flow from debt.

Ratios and Metrics

$$Reinvestment\ Rate = \frac{(Net\ Capital\ Expenditure + Change\ in\ Non - Cash\ Working\ Capital)}{After - Tax\ Operating\ Income}$$

$$Free\ Cash\ Flow = After - Tax\ Operating\ Income\ (1 - Reinvestment\ Rate)$$

$$Interest\ Coverage\ Ratio = \frac{Operating\ Income}{Interest\ Expenses}$$

$$Retention\ Ratio = 1 - \frac{Dividend}{Net\ Profit}$$

We can use the interest coverage ratio to assess the default risk of the company. With a high interest coverage ratio resulting in a AAA credit rating for example. From here, we can look up the current rate for a company with a AAA credit rating and the risk-free rate with the same maturity, with the difference being the default spread for the company.

$$After - Tax\ Cost\ of\ Debt = (Risk\ Free\ Rate + Default\ Spread) \times (1 - Marginal\ Tax\ Rate)$$

Growth

Ultimately, for a firm to grow, it has to manage its existing investments better (efficiency growth) or make new investments (new investment growth). To capture efficiency growth, you want to measure the potential for cost cutting and improved profitability. It can generate substantial growth in the near term, especially for poorly run mature firms, but not forever. To measure the growth rate from new investments, you should look at how much of its earnings a firm is reinvesting back into the business and the return on these investments.

$$Growth\ in\ Earnings = Proportion\ Invested \times Return\ on\ Investment$$

This formula is expressed as follows for both Operating Income and Net Profit:

$$Growth\ in\ Operating\ Income = Reinvestment\ Rate \times Return\ on\ Capital$$

$$Growth\ in\ Net\ Profit = Retention\ Ratio \times Return\ on\ Equity$$

Terminal Value

Since we cannot estimate cash flows forever, we generally impose closure in valuation models by stopping our estimation of cash flows sometime in the future and then computing a terminal value that reflects estimated value at that point.

If we treat the firm as a going concern at the end of the period, we can estimate the value of that concern by assuming that cash flows will grow at a constant rate forever afterwards. This perpetual growth model draws on a simple present value equation to arrive at a terminal value:

$$Terminal\ Valule\ in\ Year\ n = \frac{Cash\ Flow\ in\ Year\ (n+1)}{Discount\ Rate - Perpetual\ Growth}$$

Since the terminal value equation is sensitive to small changes and thus ripe for abuse, there are a few key constraints that should be imposed on its estimation: First, no firm can grow forever at a rate higher than the growth rate of the economy in which it operates. In fact, a simple rule of thumb on the stable growth rate is that it should not exceed the risk-free rate used in the valuation; the risk-free rate is composed of expected inflation and a real interest rate, which should equate to the nominal growth rate of the economy long term. Second, reduce the risk of the firm, as it is now considered a mature company which generally comes with less risk, therefore a reduced discount rate.

Options

When companies give options to employees, analysts often use short cuts (such as adjusting the number of shares for dilution) to deal with these options. The right approach is to value the options (using option pricing models), reduce the value of equity by the option value, and then divide by the actual number of shares outstanding.

Conclusion

Giving the market more time (say three to five years) to fix its mistakes (in pricing an asset) provides better odds than hoping that it will happen in the next quarter or the next six months.

The intrinsic value of a company reflects its fundamentals. Estimates of cash flow, growth, and risk are all embedded in that value, and it should have baked into it all of the other qualitative factors that are often linked to high value, such as a great management team, superior technology, and a long-standing brand name. There is no need for garnishing in a well-done intrinsic valuation.

Chapter 4 – Determining Relative Value

In relative valuation, you value an asset based on how similar assets are priced in the market.

The three essential steps in relative valuation are:

1. Find comparable assets that are priced by the market
2. Scale the market prices to a common variable to generate standardised prices that are comparable
3. Adjust for differences across assets when comparing their standardised values.

Higher growth companies should trade at higher prices than a lower growth company in the same sector.

The PE ratio is a consistently defined multiple, since the numerator is the price per share (which is an equity investor value), and the denominator is the earnings per share (which is also an equity investor value). So is the enterprise value to EBITDA multiple, since the numerator and denominator are both measures of operating assets (debt and equity); the enterprise value measures the market value of the operating assets of a company and the EBITDA is the cash flow generated by the operating assets. In contrast, the price to sales ratio and price to EBITDA ratio are not consistently defined since the divide the market value of equity b an operating measure. Using these multiples will lead you to finding a firm with a significant debt burden to be cheap.

Since the lowest value for these multiples is zero, and the highest can be huge, the distribution for these multiples are skewed towards the positive values. The key lesion from this distribution should be that using the averages as a comparison measure can be dangerous with any multiple. It makes far more sense to focus on the median.

When looking at the average price/earnings ratio across a group of firms, the firms with negative earnings will all drop out of the sample because the price/earnings ratio cannot be computed. The fact that the firms are taken out of the sample are the firms losing money implies that the PE ratio for the group will be biased because of the elimination of these firms. As a general rule, you should be sceptical about any multiple that results in a significant reduction in the number of firms being analysed.

Comparisons of multiples across time are fraught with danger. For instance, the common practice for branding a market to be under or overvalued based upon comparing the PE ratio to past PE ratios will lead to misleading judgements when interest rates are higher or lower than historical norms.

Multiples tend to be used in conjunction with comparable firms to determine the value of a firm or its equity. A comparable firm is one with cash flows, growth potential, and risk similar to the firm being valued. Nowhere in this definition is there a component that relates to the industry or sector to which a firm belongs. Thus, a telecommunications firm can be compared to a software firm, if the two are identical in terms of cash flow, growth, and risk.

Chapter 5 – Valuing Young Growth Companies

No relevant or important information recorded from this chapter.

Chapter 6 – Valuing Growth Companies

Growth firms get more of their value from investments that they expect to make in the future and less from investments already made. The value of growth assets is a function of not only how much growth is anticipated but also the quality of that growth, measured in terms of excess returns: returns on the invested capital in these assets, relative the cost of capital.

Stable Growth

The question of how quickly revenue growth rates will decline at a given company, as it gets bigger, can generally be addressed by looking at the company's specifics – the size of the overall market for its products and services, the strength of the competition, and the quality of both its products and management.

Assessing when a growth firm will become a stable company is difficult to do, but do not wait too long to put a firm into stable growth. Both scale and competition conspire to lower growth rates quickly at even the most promising growth companies.

Shares and Voting Rights

Some growth firms continue to be controlled by their founder, who maintains control by holding onto shares with disproportionate voting rights. If that is the case, you have to adjust for the fact that voting shares trade at a premium over nonvoting shares; studies indicate that the premium is about 5 to 10 percent at U.S. companies. To convert the voting shares to equal the non-voting shares, multiply the non-voting shares by 1 + 5 or 10 percent, then add these shares to the voting shares to give you the number of shares outstanding.

Conclusion

As firms become larger, growth rates will decline. Focus on firms that are able to diversify their product offerings cater to a wider customer base as they grow. They will see more growth as they scale up than firms that do not have this capability.

As firms become successful, there will be increased competition. Look for firms that are able to preserve profit margins and returns as they grow. Steer away from firms that have to trade off lower margins and returns for higher growth.

Chapter 7 – Valuing Mature Companies

The common characteristics of mature companies are:

- Revenue growth is approaching growth rate in the economy: While the growth rate for earnings for mature companies can be high, at least in some years, mature firms will register growth rates in revenues that, if not equal to, will converge on the nominal growth rate for the economy.
- Margins are established: Mature companies tend to have stable margins, with the exception being commodity and cyclical firms, where margins will vary as a function of macroeconomic variables.

Not all mature companies are large companies. Many small companies reach their growth ceiling quickly and essentially stay on as small mature firms.

Valuation Issues

The biggest challenge in valuing mature companies is complacency. When valuing these companies, investors are often lulled into believing that the numbers from the past (operating margins, returns on capital) are reasonable estimates of what existing assets will continue to generate in the future. However, past earnings reflect how the firm was managed over the period.

Growth

Firms can increase their long-term grow by either reinvesting more (higher reinvestment rate) or reinvesting better (higher return on capital).

Chapter 8 – Valuing Declining Companies

No relevant or important information recorded from this chapter.

Chapter 9 – Valuing Financial Service Companies

Financial services business fall into four groups depending on how they make their money. A bank makes its money on the spread between the interest it pays to those from whom it raises funds and the interest it charges to those who borrow from it, and from other services it offers to depositors and its lenders. Insurance companies make their income in two ways. One is through the premiums they receive from those who buy insurance protection from them and the other is income from the investment portfolios that they maintain to service the claims. An investment bank provides advice and supporting products for other firms to raise capital from financial markets or to consummate transactions (acquisitions, divestitures). Investment firms provide investment advice or manage investment portfolios for their clients. Their income comes from fees for investment advice and sales fees for investment portfolios.

Chapter 10 – Valuing Cyclical and Commodity Companies

Use earning averages, e.g. moving average, as a basis for calculating intrinsic value. Normalise earnings over a period of time, usually long enough to cover the entire market cycle, typically 5 to 10 years.

Chapter 11 – Valuing Companies with Intangible Assets

Accounting first principles suggest a simple rule to separate capital expenses form operating expenses. Any expense that creates benefits over many years is a capital expense, whereas expenses that generate benefits only in the current year are operating expenses.

Restating Intangibles

Research expenses, notwithstanding the uncertainty about future benefits, should be capitalised. To capitalise and value research assets, we have to make an assumption about how long it takes for research and development to be converted, on average, into commercial products. This is called the amortisable life of these assets. This life will vary across firms and reflect the commercial life of the products that emerge from the research.

For the R&D expense, it can be reasonably assumed that the amortisation rate is uniform over time. In the case of a research asset with a 10-year life, you assume that one-tenth of the expense is written off each year.

R&D Amortisation - Example				
Year	**R&D Expense**	**Unamortised Portion**		**Amortisation This Year**
Current	3030.00	1.00	3030.00	
-1	3266.00	0.90	2939.40	326.60
-2	3366.00	0.80	2692.80	336.60
-3	2314.00	0.70	1619.80	231.40
-4	2028.00	0.60	1216.80	202.80
-5	1655.00	0.50	827.50	165.50
-6	1117.00	0.40	446.80	111.70
-7	864.00	0.30	259.20	86.40
-8	845.00	0.20	169.00	84.50
-9	823.00	0.10	82.30	82.30
-10	663.00	0.00	0.00	66.30
			$13,283.60	$1,694.10

Where:

$$Unamortised\ Portion = R\&D\ Expense\ \times Unamortised\ Proportion\ Rate$$

$$Amortisation\ This\ Year = R\&D\ Expense \times Amortisation\ Rate\ of\ 10\%$$

The sum of the Unamortised Portion is the total R&D Expense that is yet to be amortised.

Amortisation This Year is the amount of Amortisation required to be paid this year on all previous years R&D Expense, with the sum of $1,694.10 being the total amount of amortisation to be recognised in the current year.

$$\begin{aligned} Adjusted\ Book\ Value &= Stated\ Book\ Valule + Capital\ Invested\ in\ R\&D \\ &= Stated\ Book\ Value + \$13{,}283.60 \end{aligned}$$

The reported accounting income is adjusted to reflect the capitalisation of R&D expenses. First, the R&D expenses that were subtracted out to arrive at the operating income are added back to the operating income, reflecting their recategorization as capital expenses. Next, the amortisation of the research asset is treated like depreciation and is netted out to arrive at the adjusted operating income and adjusted net income, calculated as follows:

$$\begin{aligned} Adj.\ Operating\ Income &= Stated\ Operating\ Income + R\&D\ Expenses - R\&D\ Amortisation \\ &= Stated\ Operating\ Income + \$3{,}030 - \$1{,}694.10 \\ Adj.\ Net\ Income &= Net\ Income + R\&D\ Expenses - R\&D\ Amortisation \\ &= Net\ Income + \$3{,}030 - \$1{,}694.10 \end{aligned}$$

While R&D are the most prominent example of capital expenses being treated as operating expenses, there are other operating expenses that arguably should be treated as capital expenses. For an operating expense to be capitalised there should be substantial evidence that the benefits from the expense accrue over multiple periods.

Capitalise these expenses using a procedure similar to that used to capitalise R&D expenses as follows:

1. Determine the period over which the benefits from the operating expense (such as SG&A) will flow.
2. Estimate the value of the asset (similar to the research asset) created by these expenses. This amount will be added back to the book value of equity/capital and used to estimate returns on equity and capital.

3. Adjust the operating income for the expense and the amortisation of the created asset.

The net effects of the capitalisation will be seen most visibly in the reinvestment rates and returns on capital you estimate for these firms.

Intrinsic Value

When you capitalise the expenses associated with creating intangible assets, you are in effect redoing the financial statements of the firm and restating numbers that are fundamental inputs into valuation – earnings, reinvestment, and measures of returns.

- Earnings: adding back the current year's expenses and subtracting out the amortisation of past expenses, the effect on earnings will generally be positive if expenses have risen over time.
- Reinvestment: The effect on reinvestment is identical to the effect on earnings, with reinvestment increasing or decreasing by exactly the same amount as earnings. That will generally increase the reinvestment rate.
- Capital invested: Since the unamortised portion of the prior year's expenses is treated as an asset, it adds to the estimated equity or capital invested in the firm. The effect will increase with the amortisable life and should therefore be higher for pharmaceutical firms (where amortisable lives tend to be longer) than for software firms (where research pays off far more quickly as commercial products).
- Return on Equity (capital): Since both earnings and capital invested are affected by capitalisation, the net effects on return on equity and capital are unpredictable. If the return on equity (capital) increases after the recapitalisation, it can be considered a rough indicator that returns earned by the firm on R&D is greater than its returns on traditional investments.

Options

Firms that pay managers and others with equity options are giving away some of the stockholders' equity to these people. To deal with the resulting loss in value to common stockholders, there are three approaches that are employed in intrinsic valuation.

1. Assume that all or some of the options will be exercised in the future, adjust the number of shares outstanding and divide the value of equity by this number to arrive at per share value; this is the diluted shares approach.

$$Intrinsic\ Value = \frac{Average\ Value\ of\ Equity}{Fully\ Diluted\ Number\ of\ Shares}$$

   While this has the virtue of simplicity, it will lead to too low an estimate of value per share, because it fails to reflect the proceeds from the option exercise.

2. Incorporate the exercise proceeds from the options in the numerator and then divide by the number of shares that would be outstanding after exercise; this is the treasury stock approach. Calculated as follows:

$$Intrinsic\ Value = \frac{Value\ of\ Equity + Options\ Outstanding \times Ave.Exercise\ Price}{Fully\ Diluted\ Number\ of\ Shares}$$

   This approach will yield too high a value per share, largely because the approach ignores the time premium on the option; an option trading at or out of the money may have no exercise value but it still has option value.

3. Estimate the value of the options today, given today's value per share and the time premium on the option. Once this value has been estimated, it is subtracted from the intrinsic value, and the remaining amount is divided by the number of shares outstanding to arrive at value per share. Based upon the exercise price ($391.40) and the average maturity (3.5 years), the options outstanding at Google are valued at $897 million.

$$Intrinsic\ Value = \frac{Value\ of\ Equity - Value\ of\ Options}{Primary\ Shares\ Outstanding}$$

When choosing which approach to take, consider that the first is the crudest, the second is slightly more tempered, and the third is the most work, but it is the right way to deal with options. The fact that most investors and analysts do not go to the trouble may provide an opportunity for those who go the extra mile in assessing options.

The only way to incorporate the effect of options into earnings multiples is to value the options at fair value, using the current stock price as the basis, and add this vale on to the market capitalisation to arrive at the total market value of equity.

Conclusion

Intangible Assets that generate high returns: For intangible assets to generate value, they have to earn high returns. Look for a firm with intangible assets that are unique and difficult to replicate.

Spending to preserve and augment these intangible assets: Intangible assets do not always stay valuable, especially if they are ignored. Focus on firms that invest in these assets (by spending on R&D, recruiting, or advertising) to preserve and grow value.

Equity Claims drain Share Value: Incorporate the effects of outstanding options into your estimates of value per share and avoid companies that are cavalier about issuing new options to managers.