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Valuation

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Introduction

There is only one way to value a company accurately: sell it. All other methods involve a degree of subjectivity not least because they involve taking a view of the future – who is to say that there is a buyer in the market who shares that view?

Of course nobody wants to go as far as selling a business to get an idea of its value. That said, it has to be remembered that mathematical methods of valuation can be manipulated where necessary:

- An unscrupulous broker asked to value a business, as part of a beauty parade to select a firm to handle the sale, will calculate a value based on the highest figure they can quote without stretching their credibility.
- Financial advisers asked to value a business for tax reasons or for the purpose of valuing a minority shareholding may well calculate the lowest value they think they can justify.
- Venture capitalists investing in established companies can reach absurdly low valuations to ensure that they obtain the largest possible shareholding for the smallest possible investment.
- More acceptably high and low valuations can be bandied about during the sale of a business, as the buyer and seller attempt to massage the expectations of the other.

Making different valuations, based on different assumptions, is, in fact, essential to the sale process:

- They can tell an executive how much a business is worth to his or her company, and therefore inform the maximum amount he or she should be prepared to pay for it or, in different circumstances, the minimum amount he or she should accept to sell it.
- They can tell an executive how much other bidders at an auction might be prepared to bid for a business, enabling him or her to decide on a bid which is high enough to secure the asset, but still low enough to ensure there is a margin of profit from acquiring the business.
- They can tell an executive how his or her shareholders might view an acquisition: whether they would consider it to be a good investment or a bad investment.

However, it is the determination of the market price today that is the aim of most valuations.

In publicly quoted companies, whose shares are regularly traded on the Stock Exchange, this valuation can be calculated very simply by multiplying up the share price by the number of shares in issue.

Everyone else has to use one of the subjective methods: discounted cash flow, price ratios, or asset based. The only way they can ensure that the valuation they obtain is as close to being objective as possible is to make sure that the assumptions are as objectively sustainable as possible.

Even then, one has to accept that the valuation reached is going to be justified for a very short space of time. Just as share prices on the stock exchange change daily as assumptions about future earnings change, so should valuations calculated by mathematical methods.

It is also important to remember that markets are far from perfect. While the auction process has become more widespread, and the expansion of the private equity sector has meant that there are always financial buyers around to pick up under-valued assets, there are still a number of obstacles to the establishment of a free market in businesses:

- *Businesses are not alike and interchangeable*: some will command a premium because they are unique, others will be ignored because they do not fit in, regardless of the financial value they could deliver.

- *There are fashions in corporate strategy*: vertical and horizontal integration, globalisation and empowerment focus have all created waves of corporate activity which have rarely had a long-term effect on earnings, but have had significant short-term effects on valuation.
- *Auctions are often oligopolistic*: usually there will be only three or four serious buyers. If their ability is impaired for any reason (such as they are between chief executives, or they have just made a big bid for something else) then the final auction price will be affected.
- *Information is not perfect*: buying a business is always going to be something of a lucky dip. The price paid will always depend on how much of a risk the various buyers are prepared to take.
- *Management makes a difference*: it is often difficult to separate the value of a business from the value of its management. One can buy one but not always the other.
- *Auctions are not open*: the fact that most auctions have to be carried out in conditions of secrecy means that some potential buyers will be excluded.

The result is that the price that a business realises on sale is often more a matter of chance than the financial value of the business.

It is for this reason that executives regularly involved in assessing the value of businesses tend to rely on instincts and rules of thumb rather than the more intellectually sound methods of valuation recommended by valuation professionals. In fact, many valuation professionals also rely on rules of thumb (such as sales multiples) and then justify their findings using more highfalutin methods such as discounted cash flow analysis.

Valuation methods

The three main methods of valuation are:

- *Discounted cash flow* (sometimes called the Capital Asset Pricing Model or CAP-M) is based on the idea that a company is worth as much as the net present value of the cash flows generated by a company for distributing around its shareholders.
- *Price multiples* compare the price per pound of the sales or profits between companies to illustrate how a business might be priced.
- *Asset-based valuations* price the balance sheet assets of a business separately to reach the value of the whole.

Discounted cash flow (DCF) valuation is theoretically the most pure. It keeps the mind focused on the actual value of the cash benefits derived from ownership rather than what other people might pay for a business. The main weakness is that it is highly dependent on forecasts. In fact in many cases it is necessary to be able to forecast more than 10 years into the future before one has a valuation which is any more accurate than a simple price multiple method. Consequently, DCF valuation tends to be used primarily within companies for the purposes of determining strategy. Consultants recommend using it as a means of assessing which course of action is most likely to build shareholder value.

Where one does not have full information about operations it is usually very difficult to carry out a DCF accurately.

Price multiples are the most widely used method of valuation. In fact, because they are so widely used, they are often the most reliable means of predicting the market price of a business. They are easy to use, and they do not require a great deal of information about the operation to be applied. Different multiples are used in different situations. Trade buyers, who tend to have a very strong idea about the profitability of businesses within their sector, often prefer to use sales multiples, although they do rely on instinct for their accuracy.

P/e (price to earnings) ratios enable one to compare the price of a pound of profit across different businesses. On the face of it they are more rigorous than sales multiples, although they do not take different accounting treatments into account, and often fail to predict what a trade buyer, who is in a position to alter the cost base of the business, might be prepared to pay. P/e ratios are the most widely used method of valuation among stockbrokers because they make it possible to compare the financial benefits of holding different shares.

Asset-based valuations are used only where the value of a business is easily expressed in terms of its assets. Where the primary assets are intangible, such as brands, copyrights, human capital, or goodwill, then asset-based valuations are less popular (or, if they are used, it is in conjunction with another valuation method). Investment trusts, property companies, mining companies, and other businesses whose assets have a clear market value are suitable for asset-based valuation.

Capital structure

The capital structure of a business will include both debt and equity. For some purposes, such as making investment or divestment decisions within a company, it is important to obtain a value of the unlevered company (ie as if it had no debt). In other circumstances, such as when one is buying a business complete with debtors and creditors, it is necessary to value the levered company.

The difference in the value of the levered and the unlevered company is not just the value of the debt. The debt will bring with it interest tax shields which have a value in themselves, and it will also impose a different risk profile on the equity. The more debt, the more risky the equity.

It would be wrong to ignore the difference between the value of the levered company and the value of the unlevered company, even in a crude valuation. However, it may be justifiable to avoid calculating the value of the interest tax shields and the additional discount for risk if one is using a crude price multiple method.

DCF valuation

DCF models aim to value a business by calculating the net present value of the free cash flows generated by it. These free cash flows are calculated as follows:

Earnings before interest and taxes (EBIT)

+ (-) non-cash expenses (revenues) eg depreciation

- cash tax payments (not including any interest tax shield)

- net cash capital expenditure

- (+) increases (decreases) in required working capital

- other cash operating expenditures not in EBIT

= **free cash flows of the unlevered business**

- post-tax cash interest and preferred stock dividends

- (+) other cash payments to (from) non-equity claimholders

= **free cash flow of the common equity**

These cash flows have to be forecast out as far as accurately possible. Every human effort has to be taken to ensure that they are as accurate as possible. One should start by analysing the business to identify the

drivers of sales, and then examine what factors have affected these drivers in the past, such as the business cycle, interest rates, exchange rates, demographics and so on. The relationship between sales and gross and operating profit has to be examined, and the balance sheet ratios that help predict capital expenditure and interest payments looked at too.

The next stage is to draw up a forecast of the profit and loss account and the balance sheet for each year, with the two feeding into each other through interest payments and retained profit. Ideally one would want to forecast at least five years ahead. In some cases it may be necessary to forecast even further. These can then be checked against themselves by seeing whether the balance sheet ratios have been maintained and the profit and loss account has remained within the scope of what has historically been achieved in the industry. Finally, figures for the free cash flow can be derived.

Once the free cash flows have been calculated, they need to be discounted at the relevant rate. This rate has to take into account three factors: the opportunity cost of capital, risk and capital structure. To calculate the discount rate relevant to the opportunity cost of capital, one has to find the amount of money one would be prepared to forgo today in exchange for receiving the forecast cash flow in the future. This is a function of the interest rate:

$$\text{Future cash} = \text{present cash} \times (1 + r)^n$$

Where r is the interest rate and n is the number of years before the future cash is generated. This equation can be rewritten as follows:

$$\text{Present cash} = \text{future cash}/(1 + r)^n$$

If one was 100 per cent sure of obtaining those future cash flows then $1/(1 + r)^n$ would be the only discount factor which needed to be applied. However, one is never sure of the future cash flows generated by a business and this has to be taken into account.

The way this is done is to include an additional risk discount factor. This can be calculated thanks to a modern portfolio which states that for any equity investment the:

Expected return = risk free return (ie if it were invested in treasury bonds) + β x the premium for having invested in the market,

where β is the riskiness of the equity investment relative to the market as a whole. This can also be expressed as:

Expected return = risk free return + β (market rate of return – risk free return)

The risk free return can be calculated by looking at the interest rate on long gilts. The market rate of return can be calculated from looking at long-term returns from investing in the market. For the UK, the premium for investing in the market has been variously estimated as between five per cent and six per cent. β is calculated as follows:

$$\beta_e = (\text{covariance of return on equity } e \text{ and the market return}) / (\text{variance of the market return})$$

This is a complex calculation, which can be easily carried out if one has access to one of the screen-based historic pricing services, but is otherwise laborious. The value of β is normally between 0 and 2.5, where a β of 0 would refer to an investment which offers the same security of a government bond, and a β of 2.5 would be appropriate to some of the more questionable penny share investments.

The β calculated above is the β of the business complete with its existing level of debt. Calculating the value of the unlevered β requires two further steps. The first step is to calculate the impact that the debt has on the relative riskiness of the business. This is done by calculating the debt β or β_d :

$$\beta_d = (\text{expected return on the business' debt} - \text{the risk free rate of return}) / (\text{expected rate of market return} - \text{the risk free rate of return})$$

This can then be fed into a formula for the unlevered β which is based on the weighted average of the debt β and the equity β , adjusted for the present value of the interest tax shields (calculated by discounting the value of the interest tax shields each year by the cost of the company's debt):

Let

β_u = β of the unlevered firm

β_e = β of the equity

β_d = β of the debt

E = market value of the equity*

D = market value of the debt

T = net present value of interest tax shields

$$\beta_u = \beta_e [(E/E + D - T)] / [\beta_d (D - T/E + D - T)]$$

*because of this circularity, it is only possible to calculate the value of an unlevered β for a quoted company, or part of a quoted company, accurately. When valuing unquoted companies it is necessary to estimate the relative proportion of the debt and equity within the capital structure, and give a weighting to the debt and equity β s accordingly.

The relevant β can then be used to determine the correct rate of return by which the cash flows have to be discounted:

Rate of return $e_r = \text{risk free rate of return} + \beta \times \text{the premium for investing in shares rather than bonds.}$

So if the interest rate on long gilts is five per cent, and one is dealing with a business which is slightly more risky than the market as a whole (i.e. $\beta = 1.2$) then the relevant interest rate to use in the discounting formula is 12.2 per cent (i.e. $1.05 + 1.2 \times 0.06$).

This interest rate is then used to discount the forecast cash flows as follows:

Present value = free cash flow/ $(1 + e_r)^n$

The value of the business is equal to the sum of the net present value of the free cash flows from now until the end of time. As it is not possible to forecast them that far into the future, the normal practice is to forecast them as far as possible and then to add a terminal valuation representing the value of the business after the forecast period.

The terminal valuation has to be calculated by an alternative method, such as a price multiple method or an asset-based method. The alternative is to agree a constant level of growth that would apply after the forecast period, whose net present value can easily be calculated.

The important thing is to ensure that not too much of the value of the business is the result of the terminal value after the forecast period. If it is, one may well be better off using another valuation method in the first place.

Price multiple models

The alternative to a discounted cash flow model for valuing a firm is a price multiple model. This does not attempt to reach an absolute value

for a firm with the integrity of a DCF valuation. Instead, it provides a means of comparing the price of a firm with others in the same sector. The differed multiples used include:

- price to earnings (after tax) – the p/e ratio;
- price to operating cash flow (EBITDA);
- price to free cash flow to common shareholders – the free cash flow multiple;
- price to sales – the sales multiple;
- price to operating profit;
- price to gross margin;
- price to earnings before interest and taxes;
- price to net book value;
- price to replacement cost of net book value (ie replacement cost of the assets less market value of the liabilities);
- market value of the equity plus debt to operating cash flow.

Of these, only price earnings multiples and sales multiples are used regularly. The others are used only in special circumstances. For example, when comparing companies that are subject to different tax regimes, one might look at free cash flow multiples. Price to net book value ratios are commonly used where the assets rather than the cash flows drive the value of the company, ie in banking.

Applying a p/e ratio involves finding a proxy, or series of proxy companies, that face similar earnings growth prospects and whose price is known (either because they are quoted or because they have been involved in a recent trade sale). This is used to obtain a relevant p/e ratio for the company being valued, which can then be multiplied by that company's earnings to reach a valuation:

Market value of a business = earnings of business × p/e ratio of proxy company

Sales multiples work in the same way but using price/sales ratios rather than price/earnings.

The main weakness is that it has no objectivity in the selection of proxies. One also has to bear in mind that sales multiples do not take the capital structure of the business being valued into account. There is also a temptation to overstate the value of a business by applying p/e ratios from last year's accounts to earnings forecasts for next year without discounting for risk, inflation or the opportunity cost of holding cash.

Asset-based valuations

In many businesses the assets on the balance sheet are the main driver of value, and the assets themselves have an easily established market value. This is particularly true of the financial services sector, but can also be applied to other areas such as property, house building, and mining. In these circumstances, asset-based valuations tend to be used.

The total value of the asset, as accounted for on the balance sheet, can be added up, and liabilities deducted to reach a value of the business. Usually this value is notional: most businesses actually trade at a discount to their net asset value because of the costs associated with assessing that value. This discount can be estimated by looking at the discounts which apply to similar businesses either on the stock exchange or in recent trade sales.