

INVESTMENT KNOWLEDGE SERIES

VALUATION



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Valuation

© Capital City Training Limited



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At various points in the manual a number of financial analysis issues are examined. The financial analysis implications for these issues, although relatively standard in treatment, remain an opinion of the authors of this manual. No responsibility is assumed for any action taken or inaction as a result of the financial analysis included in the manual.

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1 • Discounted cash flow techniques

Discounting fundamentals

Discounted Cash Flow (DCF) valuations are founded on the premise that:

**Company value =
value of the future cash flows generated by the company
discounted at the required rate of return demanded by the investors**

A number of questions need to be answered:

- What is the cash flow?
- What is free cash flow (FCF)? How does it relate to FCF to firm and FCF to equity?
- How is the cash flow derived?
- What drives cash flow?
- How many years of cash flow forecasts must be produced to complete a valuation?

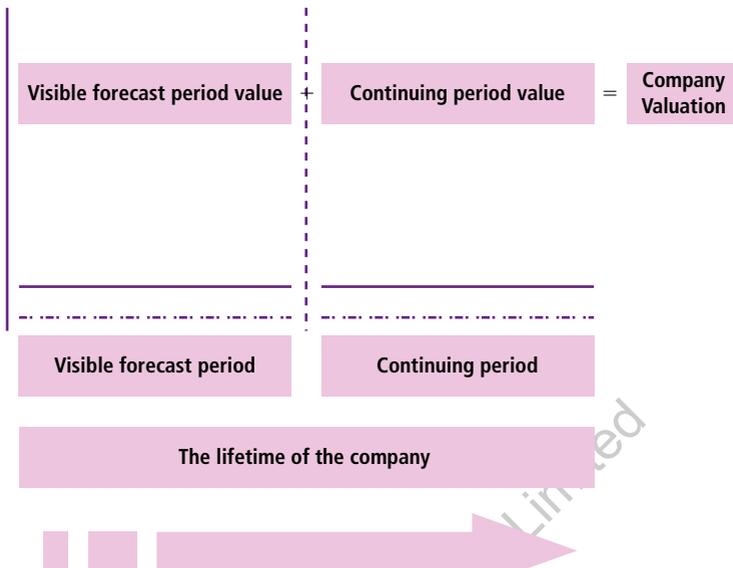
Understanding the structure of DCF valuations

Realistically, it is difficult to forecast the entire cash flow profile of any company because of issues such as uncertainty:

- We do not know how long the company will exist and hence how many years to include in our cash flow forecast
- Forecasting is estimation. The further we predict into the future, the more prone to error our estimates become.

To address these issues many DCF models, whether estimating equity or firm value, will follow a two-stage approach to the forecasting of cash flows. The stages of a company's cash flow profile are split on the basis of:

- A visible forecast cash flow period
- A continuing period.



The two-stage approach to DCF valuations

The two-stage approach to DCF valuations is a common solution to the problem of how we forecast the cash flow profile of a company. The approach is to forecast the cash flows of a company over a finite period of time, usually between 5 and 10 years. Analysts for some industrial groups (utilities and mining) may extend this period as far as 25 years, where cash flows tend to be contractual.

After this initial period of more detailed forecasting the remaining value of the company is captured by a terminal value, using either a perpetuity or multiple calculation (see above diagram – the continuing period value).

The valuation of the cash flows after the initial detailed forecasting period is often seen as a significant estimate or guess in the valuation process. The value estimated through the terminal value calculation can also be significant, relative to the full company valuation, and is very sensitive to its inputs.

However, the terminal value can be reviewed for reasonableness with respect to peers (cross sectional comparison) and the performance of the business itself (time series comparison).

The argument for using the terminal value calculation to capture the company's value post the visible forecast period is based on the premise that the company will hit a

stage of maturity. Beyond this point, cash inflows to the company may grow with the rest of the economy and can be viewed as indefinite, if there is the necessary level of reinvestment back into the business. Capital expenditure, working capital and research and development will all have to be sustained to maintain the company's existing position.

The obvious benefit of the terminal value calculation is that we do not have to forecast cash flows forever. However, blind reliance on the terminal value calculation is a danger and is naïve.

The competitive advantage period (CAP)

The CAP is the time period during which it is believed that the company is expected to generate returns on incremental investments in excess of the cost of capital.

Economic theories of the firm state that the generation of returns in excess of the cost of capital will attract competition. This competition will enter the market, providing barriers to entry are sufficiently low, and eventually force returns towards the cost of capital.

The issue for valuation lies in estimating the CAP to determine the visible forecast period. This is because the CAP will establish the length over which cash flows need to be estimated prior to the reliance on a terminal value calculation.

A number of strategic approaches have been developed to assist in determining the length of the CAP. Examples of such techniques are noted below:

- Porter's 5 forces
- Value chain analysis
- Product life cycle.

Using a combination of these tools, an estimate of the CAP can be determined. Generally, analysts will forecast between 5 and 10 years' cash flows before relying on a terminal value calculation to capture post CAP cash flows.

The determination of an appropriate CAP is obviously crucial for the valuation process, as it defines the use of the terminal value calculation and its impact.

Estimating free cash flow for valuation purposes

We need cash flows to discount, in order to arrive at a valuation. We now have an idea of how we estimate a company's cash flow profile – we split the model into 2 stages – a visible forecast period and a terminal value period. We estimate cash flows

during the visible forecast period and then capture subsequent future cash flows through a terminal value calculation.

Why discount cash flows?

It seems obvious that a DCF valuation should focus on cash flows. However, there is clear reasoning why we focus on cash.

The alternative to using cash is to focus on some sort of earnings measure (as a number of the comps valuation techniques will do). The downside to an earnings measure is that it uses an earnings figure. Earnings can be manipulated in terms of revenue and cost recognition; it is affected by non-recurring items and changes in accounting policy. Much of the work with comps valuation is spent trying to “clean” the earnings information prior to it being used in the valuation process.

At the end of the day....

“Cash is fact – profit is an opinion”

The Economist 2nd August 1997

A focus on earnings will also ignore a number of key considerations for the valuation process – such as:

- Risk considerations are ignored in accounting earnings
- Reinvestment needs are ignored
- The time value of money is ignored
- Earnings are historic, valuation is forward looking.

Cash flow is the energy of a business. Earnings do not pay bills, invest in capital expenditure or recruit new human resource – cash is required to partake in any of these activities. Hence a focus on cash flow is a focus on where a company generates future value for shareholders.

This statement that cash flow generates value to support shareholder returns finds support with empirical evidence. There has been a significant amount of economic research that has found that there is a weak statistical link between accounting based earnings and shareholder returns. However, the same types of studies presented using cash flow based measures have produced much stronger relationships between cash flow and shareholder returns.

Which cash flows do we use?

Cash flow is a generic term and can refer to a number of different definitions.

The illustration below demonstrates the derivation of operating cash flow for accounting purposes:

Derivation of cash flow		£'000s
Sales		X
Operating costs		<u>(X)</u>
EBIT / Operating profit		X
Depreciation		X
Amortisation		<u>X</u>
EBITDA		X
Changes in working capital		<u>X/(X)</u>
Operating cash flow		<u>X/(X)</u>

This operating cash flow however does not go far enough for valuation purposes.

The illustration below outlines the basic derivation of cash flow:

Derivation of accounting operating cash flow	
Sales	125,000
Operating costs	75,000
Increase in debtors (receivables)	12,000
Decrease in stocks (inventories)	9,000
Increase in creditors (payables)	7,500
Depreciation (included in operating costs)	2,300
Amortisation (included in operating costs)	750

Derivation of accounting operating cash flow	
Sales	125,000
Operating costs	<u>(75,000)</u>
EBIT / Operating profit	50,000
Depreciation	2,300
Amortisation	<u>750</u>
EBITDA	53,050
Decrease in stocks (inventories)	9,000
Increase in debtors (receivables)	(12,000)
Increase in creditors (payables)	<u>7,500</u>
Operating cash flow	<u>57,550</u>

A major difference between accounting operating cash flow and the cash flow required for valuation purposes is that the latter will take into account the investment required to maintain existing cash flows and to support future cash flows.

FCF to firm vs. FCF to equity

DCF valuation techniques focus on free cash flow (FCF). A basic definition of Free Cash Flow to the Firm (FCFF) is:

“the amount of cash that a company has left over after it has paid all of its expenses, but before any payments or receipts of interest or dividends, before any payments to or from providers of capital and adjusting tax paid to what it would have been if the company had no cash or debt” .

The nature of the FCF measure will depend on the type of DCF valuation that is being performed. A FCF valuation which values the whole company (firm value) will focus on a different FCF to that which produces an equity valuation.

The FCF required to perform a valuation of equity is the potential cash claim equity shareholders will have after all expenses have been paid. This is known as the free cash flow to equity (FCFE).

The “cash left over” for a FCF valuation of the entire company (the firm value) will be the potential cash claims all providers of finance will have after all expenses have been paid. This is known as the free cash flow to firm (FCFF) and is defined above.

The main difference between FCFE and FCFF is the interest paid (net of tax) to debt finance providers. FCFF is before interest.

FCFE is also after the cash flows arising from debt repayments; one reason why it is difficult to use in practice.

The illustration below details the full breakdown of the accounting operating cash flow down to the FCFF and FCFE levels:

Derivation of cash flow		£'000s
Sales		X
Operating costs		<u>(X)</u>
EBIT / Operating profit		X
Depreciation		X
Amortisation		<u>X</u>
EBITDA		X
Changes in working capital		<u>X/(X)</u>
Operating cash flow		X
Tax paid (calculated on EBIT)		(X)
Capex		<u>(X)</u>
Free cash flow (to firm)		<u>X/(X)</u>
Interest paid (net of tax)		<u>(X)</u>
Free cash flow (to equity)		<u>X/(X)</u>

Note: the tax paid figure above should be a pre interest figure (unlevered) – calculated on EBIT or EBITA.

A FCFF DCF valuation will involve forecasting these cash flows over the visible cash flow period; cash flows post the visible cash flow period will be captured through a terminal value calculation.

The above breakdown of FCF gives an indication of how cash flows will be driven during the forecast visible cash flow period.

The key value drivers of cash flow

Having examined the derivation of FCF at the equity and firm level, we can examine how we forecast and drive these cash flows. In order to forecast the cash flows of a company we need to have a sound understanding of the company's business model, its strategies and the markets the company operates in. Much of this knowledge can be analysed using the strategic analysis tools we used in estimating the length of the visible cash flow period. However, there is no substitute for sector knowledge and experience.

The key drivers of FCF cash flows are:

- Sales growth rates
- EBITDA margins
- Cash tax rates
- Fixed capital investment or capital expenditure
- Working capital requirements.

We shall examine in turn the influence each factor has on FCF:

Sales growth rates

The first driver of cash flow growth – without sales there is no company, no business, and therefore no cash. Obviously this is a crucial forecast driver.

The starting point of the sales analysis will be current sales activity. Consideration can then be given to recent investment activity at the capital expenditure and working capital levels to see if there is any foundation for future growth. Any expectations based on this level of analysis will have to be adjusted for:

- Market information
- Strategic considerations
- Pricing policy decisions
- Economic considerations
- Current and prospective competition (and barriers to entry).

EBIT and EBITDA margins

Margins are useful for driving cash flow as they reflect the earnings after taking into consideration the normal costs of operations.

It is important to note that margins will depend on the nature of the business and the sales it makes. Commercially, the higher the capital expenditure and working capital requirements, the higher the margins must be to maintain a viable business.

When forecasting cash flows, margins allow valuation models to make an efficient jump from pure sales forecasts to profit figures.

Cash tax rate

If a company is generating positive EBIT, it is likely that tax will have to be paid. The forecasting of tax to be paid is a more specialist area than forecasting sales. Consideration must be given to the tax legislation, the possibility of claiming relief for previously incurred tax losses and the impact of deferred taxation.

To circumvent unnecessary complications in the forecasting process, cash tax rates will generally be used and driven through EBIT or EBITA (treating the depreciation charge as an approximation to the allowed tax depreciation deduction), with effective cash tax rates adjusting for all other tax adjustments.

Fixed and working capital requirements

As mentioned earlier the main difference between operating cash flow and cash flows for valuation purposes, is the investment necessary to maintain existing cash flows and support future cash flows.

Working capital requirements support current operations as well as supporting future growth. For instance, holding stocks (inventories) will satisfy current demand, as well as supporting future demand. For most business models, as sales grow, working capital investment will grow too.

Fixed capital requirements can be split into two elements:

- Maintenance capital expenditure – the replacement of the existing capital base, in order to satisfy existing demand and requirements
- Investment capital expenditure – the investment in new assets to meet forecast growth projections.

If a business model is forecasting growth, this growth must have a source. The source of longer term growth will be investment capital expenditure. Higher capital expenditure should be reflected in higher sales growth in the short to medium term. As the company expands, working capital requirements should also expand in response.

Calculating the terminal value

Earlier we introduced the structure of the standard DCF valuation – that is a two-stage valuation approach. Cash flows are forecast during the visible cash flow period, with post visible cash flow period cash flows captured through a terminal value calculation. Most DCF valuation models will use a visible cash flow period between 5 and 10 years. This period would have been estimated using the strategic analysis tools mentioned earlier.

Some business models (for instance mining and utilities) will have visible cash flow period in excess of 20 years. Under these circumstances, the calculation of a terminal value at the end of a 20 year cash flow stream is often insignificant due to the impact of the time value of money and the residual value left in the business after 20 years. For this reason, DCF valuations with extended visible cash flow periods will often not calculate a terminal value as its impact on the total valuation is deemed to be immaterial.

For shorter visible cash flow period DCF valuations, the calculation of the terminal value is a crucial and sensitive element.

There are a number of steps required in order to calculate a terminal value:

- Select a terminal value calculation method
- Estimate the relevant parameters for the terminal value calculation
- Calculate the terminal value
- Convert the terminal value into present value terms.

The Investment knowledge Series encapsulates years of real world experience and the knowledge that comes from training and working with the leading financial institutions around the globe. The company valuation manual is a must for those requiring an accessible guide to the core corporate finance skill of comparable and discounted cash flow valuation.

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