

Free cash flows to the firm (FCFF)

Quick review:

All DCF models ultimately boil down to estimating four inputs: cash flows from existing assets, an expected growth rate in such cash flows, a terminal value (i.e., when a firm has reached stable growth), and a discount rate.

We have already covered two such models, the DDM and the FCFE. Here we will cover the FCFF. How are the models different?

- DDM – discounting dividends is usually the most conservative estimate of value for the equity in any firm, since most firms pay out less in dividends than they can afford to.
- FCFE – the FCFE is the cash flow that is left over after meeting all reinvestment needs and making debt payments. So, this cash flow *could* be paid out as dividends, and therefore will yield a more realistic value of the firm.
- FCFF – the FCFF is the cash flow to *all* holders of capital in the firm, i.e., the equity holders and the bond holders. Done consistently, the FCFE and the FCFF should give the same value for equity. However, the FCFE are after net debt issues or payments and become more difficult to estimate when leverage is changing over time. FCFF does not have this problem since these are predebt cash flows.

How do we estimate the different inputs that go into FCFF valuation?

- $FCFF = EBIT(1-t) - (\text{capital expenditures} - \text{depreciation}) - (\text{change in noncash working capital})$
- The growth rate in EBIT = Reinvestment rate * Return on capital (ROC)

Where:

Reinvestment rate =

$$\{(\text{capital expenditures} - \text{depreciation}) + (\text{change in noncash working capital})\} \div \{EBIT(1-t)\}$$

$$ROC = \{EBIT(1-t)\} \div \{BV \text{ of debt} + BV \text{ of equity}\}$$

- The discount rate is the WACC = $W_e * K_e + W_d * K_d (*1-t)$
- The terminal value = $\{EBIT_{n+1}(1-t)(1-\text{Reinvestment rate})\} \div (WACC_n - \text{stable growth rate})$

The discounted FCFF gives us the value of the firm (V_F). The value of equity is calculated as follows:

$$V_E = \{V_F - V_D - V_{\text{Preferred}} - V_{\text{Options}}\} \div \{\# \text{ of shares outstanding}\}$$

Note that V_D here refers to the market value of debt, not the book value.

Here is an example of a three-stage FCFF valuation:

| Year | Expected growth | EBIT* (1-tax rate) | Reinvestment rate | FCFF | WACC | PV |
|---------------------------|-----------------|----------------------|-------------------|-------------|------|----|
| | A | $B = B(T-1) * (1+A)$ | C | $D=B*(1-C)$ | E | F |
| <i>High growth period</i> | | | | | | |
| Current | | | | | | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| <i>Transition period</i> | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| <i>Terminal value</i> | | | | | | |