

Background literature

6.1 Standard valuation references

Traditional valuation models can be divided into four broad categories:

1. Income-based approaches – try to capture the value of the firm by estimating its ability to generate the desired cash flows. Income (expressed by cash flows, dividends and/or residual income) and cost of capital (return required by investors) are at the core of this type of approach.
2. Asset-based approaches - use the book value of a firm's existing assets as a starting point to estimate its total value.
3. Relative (multiple) valuation approaches – consider the pricing of assets with similar risk-and-return characteristics to determine firm value. This comparison can be based on several metrics, such as earnings, cash flows, sales, or prices.
4. (Real) Option approaches – seek to estimate the value of managerial flexibility based on the potential variability of cash flows generated by the firm.

An extensive review of the different valuation approaches can be found, among others, in (Damodaran, 2007) and (Cobb & Charnes, 2007).

Recent evidence (Pinto, Robinson, & Stowe, 2019) suggests that most equity analysts use a combination of income-based approaches (most often the Discounted cash flow (DCF) method using the Capital Asset Pricing Model (CAPM) to calculate the cost of capital) and multiple approaches (both Price/Earnings (P/E) and enterprise value (EV) multiples).

Each approach presents advantages and challenges. Income-based approaches (in particular the DCF method) have the advantage of being based on solid economic reasoning and detailed inputs. Therefore, the valuation method presented in this guide is largely based on the DCF approach (Section 8). However, the preciseness of the valuation estimates produced by this method is still largely dependent on the subjectivity of the model's inputs, such as future cash flows and cost of capital. Combining the DCF method and a relative (multiple) approach has the advantage of providing a more complete picture of the potential value of a firm by referring to relevant market pricing. Therefore, we recommend using the DCF approach as a departure point and assess the soundness of the produced valuation estimate by complementing the analysis with a market multiple approach (Section 9).

Options-based approaches seem to be much less used by financial analysts (options-based approaches are used by 5% of the survey respondents in Pinto et al. 2019). We believe that in the context of valuation reflecting ESG dimensions, this approach has several advantages. Therefore, we dedicate a section of this guide to this type of approach (Section 9.4).

Asset-based approaches are generally based on the same principles as income-based approaches but have the disadvantage of being less “future oriented”. While income-based approaches focus on estimated future cash flows at specific dates, asset-based approaches use the book value of the firms’ existing assets today as a departure point. Ignoring the value of future developments is a potential pitfall of this type of approach. Given the similarity of the principles of the two approaches, and the importance of properly valuing future assets in the ESG context, this guide focuses on the income-based approach.

An interesting intermediate approach can be the Residual Income Model (Ohlson, 1995). The model estimates future cash flow but uses accounting earnings rather than free cash flow. However, it uses the book value of current assets as its departing point. The model's focus on the current book value of assets forces the analyst to evaluate if these assets are currently valued properly.

6.2 Relevant literature on valuation reflecting the ESG dimensions

Academic literature providing guidance on valuation reflecting the ESG dimensions is currently scarce. However, the results of several academic papers provide important insights on how ESG dimensions impact the different components of traditional valuation methods.

In the DCF approach, ESG considerations can affect firm value through two main channels: the cash flow channel and the cost of capital channel. These two channels correspond, respectively, to the numerator and the denominator of the DCF model.

In this context, when assessing the cost of capital, it is important to differentiate between systematic risk (related to the general market risk that all firms face, such as macroeconomic conditions like interest and inflation rates, commonly known as the firm's β) and idiosyncratic risk (or firm-specific risk, related to the operations of a particular company). While the latter can typically be diversified away by investors, systematic risk cannot. Therefore, in a traditional DCF model, systematic risk (β) will affect a firm's cost of capital (the denominator of the model), whereas idiosyncratic risk will influence the firm's cash flows (numerator in the DCF model).

Investors often adjust a firm's cost of capital for different types of risk that can be diversified. Country risk, for example, can be diversified by investing in an international portfolio. Therefore, such an adjustment of systematic risk is unnecessary, as this type of risk should not be priced.

6.2.1 The cash flow channel

The cash flow channel can affect firm value through both changed profitability (cash flows) and a change in firm-specific downside risk (idiosyncratic risk). Empirical academic literature has long been trying to establish the link between ESG and firm profitability and risk. Several studies have established a positive correlation between ESG scores and firm value:

- Stakeholder welfare (in particular, employee welfare and environmental performance) is associated with higher firm valuation (Tobin's Q) (Jiao, 2010).

- High sustainability companies significantly outperform their counterparts over the long-term (in terms of both stock market and accounting performance) (Eccles, Ioannou, & Serafeim, 2014).
- Higher CSR performance is associated with better long-run growth prospects (Gregory, Tharyan, & Whittaker, 2014).

However, establishing a causal relation between ESG scores¹¹ and firm value is not a trivial exercise. Profitability may induce firms to invest more in ESG (reverse causality), which may also justify the empirically observed correlation between ESG scores and firm value. In Section 8.1 of this guide, we provide an overview of ESG issues that may affect future cash flows.

As discussed above, firm-specific risk may also affect future cash flows. This type of risk can typically be diversified, which is why it should affect the numerator (and not the denominator) of the DCF model. Existing literature provides ample evidence of the relation between ESG and idiosyncratic risk:

- CSR is positively and strongly related to financial risk. (Oikonomou, Brooks, & Pavelin, 2012).
- Stock-specific volatility of stocks with the worst ESG exposures is up to 10-15% higher (Dunn, Fitzgibbons, & Pomorski, 2018).
- CSR activities provide an “insurance-like” benefit to shareholders (Godfrey, Merrill, & Hansen, 2009).
- Top management of U.S. firms in controversial industries is, in general, risk averse, and CSR engagement helps them reduce risk (Jo & Na, 2012).

Idiosyncratic risk will typically affect a firm’s cash flows in extreme events. Therefore, we argue that this type of risk can best be incorporated in valuation by using standard scenario analysis approaches (Section 9.3).

¹¹ Note that the general term ‘ESG’ and CSR (Corporate Social Responsibility) are highly correlated and thus not consistently applied in the literature.

6.2.2 The cost of capital channel

Firm valuation is not only dependent on a firm's ability to generate future cash flows. In any valuation model, generated cash flows are discounted using the firm's cost of capital, the required return given an investor's level of exposure to (systematic) risk. Several academic papers have established a negative relation between ESG scores and cost of capital:

- Firms with better CSR scores exhibit a lower implied cost of capital (El Ghoul, Guedhami, Kwok, & Mishra, 2011).
- Firms with better CSR performance enjoy a reduction in their cost of capital after initiating disclosure of CSR activities (Dhaliwal, Li, Tsang, & Yang, 2011).
- Superior CSR performance leads to better access to finance and a lower cost of capital (Cheng, Ioannou, & Serafeim, 2014).
- Firms with better environmental risk management have a lower cost of capital, shift from equity to debt financing, and have higher tax benefits due to the ability to add more debt (Sharfman & Fernando, 2008).

Empirically, the implied cost of capital is typically calculated as the discount rate that equates a valuation measure (often a stock price-based measure) with an observed income(earnings) measure. Therefore, the main challenge in this literature is that the cost of capital can only be measured *ex-post*, whereas for valuation purposes one would like to determine the appropriate cost of capital *ex-ante*. A lower measured *ex-post* cost of capital may be the consequence of a firm's valuation (stock price) being *ex-post* higher than the firm's projected (*ex-ante*) income (cash-flows) would justify. In Section 8.2 we present further empirical evidence on the impact of ESG factors on the cost of capital and provide guidance on how to incorporate that evidence on the *ex-ante* calculation of a firm's cost of capital.

6.3 Surveys on how investors use ESG information in valuation

Recent surveys show that investors mostly use ESG information for “red-flagging” and to manage risk (Van Duuren, Plantinga, & Scholtens, 2016). According to Amel-Zadeh & Serafeim (2018), financial analysts consider that ESG scores mainly provide information about firm risk. When it comes to valuation reflecting ESG dimensions, there is no one-size-fits-all approach, since the materiality of different issues varies widely across sectors. Lack of comparability due to the lack of reporting standards is perceived as the main impediment to the use of ESG information. As a consequence, ESG information is mostly used for negative screening and risk assessment, and less for adding in any value from new opportunities.