DISCOUNTED CASH FLOW

What Is Discounted Cash Flow (DCF)?

Discounted cash flow (DCF) refers to a valuation method that estimates the value of an investment using its expected future cash flows.

DCF analysis attempts to determine the value of an investment today, based on projections of how much money that investment will generate in the future.

DCF analysis can help those considering whether to acquire a company or buy securities make their decisions.

Discounted cash flow analysis can also assist business owners and managers in making capital budgeting or operating expenditures decisions.

The purpose of DCF analysis is to estimate the money an investor would receive from an investment, adjusted for the time value of money.

A DCF analysis is useful in any situation where a person is paying money in the present with expectations of receiving more money in the future.

For example, assuming a 5% annual interest rate, $1 in a savings account will be worth $1.05 in a year. Similarly, if a $1 payment is delayed for a year, its present value is 95 cents because you cannot transfer it to your savings account to earn interest.

Discounted cash flow analysis finds the present value of expected future cash flows using a discount rate. Investors can use the concept of the present value of money to determine whether the future cash flows of an investment or project are greater than the value of the initial investment.

If the DCF value calculated is higher than the current cost of the investment, the opportunity should be considered. If the calculated value is lower than the cost, then it may not be a good opportunity, or more research and analysis may be needed before moving forward with it.

To conduct a DCF analysis, an investor must make estimates about future cash flows and the ending value of the investment, equipment, or other assets.

The investor must also determine an appropriate discount rate for the DCF model, which will vary depending on the project or investment under consideration. Factors such as the company or investor's risk profile and the conditions of the capital markets can affect the discount rate chosen.

If the investor cannot estimate future cash flows or the project is very complex, DCF will not have much value and alternative models should be employed.

Discounted Cash Flow Formula

The formula for DCF is:

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_n}{(1+r)^n}$$

CF_1 = The cash flow for year one

CF_2 = The cash flow for year two

CF_n = The cash flow for additional years

r = The discount rate

Example of DCF

When a company analyzes whether it should invest in a certain project or purchase new equipment, it usually uses its weighted average cost of capital (WACC) as the discount rate to evaluate the DCF.

The WACC incorporates the average rate of return that shareholders in the firm are expecting for the given year.

For example, say that your company wants to launch a project. The company's WACC is 5%. That means that you will use 5% as your discount rate.

The initial investment is $11 million, and the project will last for five years, with the following estimated cash flows per year.

Cash Flow

Year	Cash Flow
1	$1 million
2	$1 million
3	$4 million
4	$4 million
5	$6 million

Using the DCF formula, the calculated discounted cash flows for the project are as follows:

Discounted Cash Flow

Year	Cash Flow	Discounted Cash Flow (nearest $)
1	$1 million	$952,381
2	$1 million	$907,029
3	$4 million	$3,455,350
4	$4 million	$3,290,810
5	$6 million	$4,701,157

Adding up all of the discounted cash flows results in a value of $13,306,727. By subtracting the initial investment of $11 million from that value, we get a net present value (NPV) of $2,306,727.

The positive number of $2,306,727 indicates that the project could generate a return higher than the initial cost—a positive return on the investment. Therefore, the project may be worth making.

If the project had cost $14 million, the NPV would have been -$693,272. That would indicate that the project cost would be more than the projected return. Thus, it might not be worth making.

Advantages and Disadvantages of DCF

Advantages

Discounted cash flow analysis can provide investors and companies with an idea of whether a proposed investment is worthwhile.

It is the analysis that can be applied to a variety of investments and capital projects where future cash flows can be reasonably estimated.

Its projections can be tweaked to provide different results for various what-if scenarios. This can help users account for different projections that might be possible.

Disadvantages

The major limitation of discounted cash flow analysis is that it involves estimates, not actual figures. So the result of DCF is also an estimate. That means that for DCF to be useful, individual investors and companies must estimate a discount rate and cash flows correctly.

Furthermore, future cash flows rely on a variety of factors, such as market demand, the status of the economy, technology, competition, and unforeseen threats or opportunities. These can't be quantified exactly. Investors must understand this inherent drawback for their decision-making.

DCF shouldn't necessarily be relied on exclusively even if solid estimates can be made. Companies and investors should consider other, known factors as well when sizing up an investment opportunity. In addition, comparable company analysis and precedent transactions are two other, common valuation methods that might be used.

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