



Excel Financial Modeling: Cash Flows, Budgeting, Reducing Error, Common Pitfalls

Course #4134A

Business

2 Credit Hours

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EXCEL FINANCIAL MODELING: CASH FLOWS, BUDGETING, REDUCING ERROR, COMMON PITFALLS

This course offers a guide to help you create informative and enlightening financial models. All you need is a basic understanding of Excel to start building models with practical hands-on exercises. This course will focus on: discounted cash flow, reusable budget models, strategies to avoid using, and common pitfalls of modeling

LEARNING ASSIGNMENTS AND OBJECTIVES

As a result of studying each assignment, you should be able to meet the objectives listed below each individual assignment.

SUBJECTS

Building a Discounted Cash Flow Valuation
Budgeting for Capital Expenditure and Depreciation
Ten Strategies for Reducing Error
Ten Common Pitfalls to Avoid

Study the course materials from pages 1 to 60

Complete the review questions at the end of each chapter

Answer the exam questions 1 to 10

Objectives:

- Identify the components of a discounted cash flow analysis.
- Recognize how to work with depreciation and capital expenditures.
- Identify the meaning behind certain common error codes.
- Identify issues that could arise in financial models.

NOTICE

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EXAM OUTLINE

- **TEST FORMAT:** The final exam for this course consists of 10 multiple-choice questions and is based specifically on the information covered in the course materials.
- **ACCESS FINAL EXAM:** Log in to your account and click Take Exam. A copy of the final exam is provided at the end of these course materials for your convenience, however you must submit your answers online to receive credit for the course.
- **LICENSE RENEWAL INFORMATION:** This course qualifies for **2** CPE hours.
- **PROCESSING:** You will receive the score for your final exam immediately after it is submitted. A score of 70% or better is required to pass.
- **CERTIFICATE OF COMPLETION:** Will be available in your account to view online or print. If you do not pass an exam, it can be retaken free of charge.

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CHAPTER 1: BUILDING A DISCOUNTED CASH FLOW VALUATION

Chapter Objective

After completing this chapter, you should be able to:

- Identify the components of a discounted cash flow analysis.

IN THIS CHAPTER

- Getting acquainted with discounted cash flow models
- Calculating free cash flow to firm
- Calculating weighted average cost of capital
- Finding terminal value
- Discounting cash flows and valuation

The discounted cash flow (DCF) model is one of the most commonly used methods of finding the value of a company or any other cash flowing asset. In fact, many other methods of valuation — such as cash flow multiples and the leveraged buyout model — are proxies or derivatives of the DCF model. Normally, modelers use the DCF when trying to decide what the value of an asset is. For example, you may be considering purchasing a company or a large piece of equipment and want to know what the value of the asset is *for you*.

DCF calculations are normally an add-on to an existing, working financial model, but in order to use the DCF method to arrive at a value for the asset, you need to make sure that the model contains the following three pieces of information:

- Free cash flow to the firm, or the information necessary to calculate this
- Weighted average cost of capital
- Perpetuity growth rate (an assumption)

In this chapter, I explain how to pull out the pieces of information you need in order to calculate value using the DCF method. Of course, before you do so, you need to make sure that you have all the necessary inputs. If you didn't build the financial model that contains the information you'll be using, make sure that you understand the information you've been given and that the financial model is correct.

UNDERSTANDING HOW THE DISCOUNTED CASH FLOW VALUATION WORKS

The core concept of the DCF is that of the basic finance concept of the *time value of money*, which states that money is worth more in the present than the same amount in the future. In other words, a dollar today is worth more than a dollar tomorrow.

The idea behind the time value of money is that if you have to wait to receive your funds, you're missing out on other potential investment opportunities, not to mention the risk of not receiving the money at all. If you have to wait to get your money, you'd expect some compensation — hence, the concept of interest. For example, if you invest \$100 at a 10 percent annual interest rate today, it will be worth \$110 in one year. Conversely, \$110 in one year would only be worth \$100 today. In this example, the 10 percent is referred to as the *discount rate*. As the name suggests, the discount rate is a key input you need to calculate the DCF.

A DCF valuation uses a modeler's projections of future cash flow for a business, project, or asset and discounts this cash flow by the discount rate to find what it's worth today. This amount is called the *present value* (PV). Excel has a built-in function that automatically calculates PV.

Technical Stuff



If you want to know the math behind the function, here's how to calculate PV, where CF is the cash flow for the projected year, r is the discount rate, and n is the number of years in the future:

$$PV = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \dots + \frac{CF_n}{(1+r)^n}$$

In the case of a project or asset with finite cash flows, the modeler would forecast all the cash flows and discount them to find the present value. For example, if you were purchasing an asset such as a large piece of machinery that has an expected life of ten years, you would model the entire ten years. When purchasing a business, however, which is expected to be a going concern and the cash flows are expected to continue into perpetuity, a DCF analysis must find a terminal value at the end of a certain forecast period instead of forecasting cash flows into eternity.

The *terminal value* represents the projected value of the company or asset at the end of the forecast period. Forecast periods are typically projected to the point at which cash flows are expected to grow at a stable and predictable rate. When the cash flows become stable, you can then reasonably estimate a fair value for the steady cash flows that are earned after that point in time.

There are variations of the DCF analysis in which the cash flows, discount rates, and terminal values can differ, but the most common method is to project free cash flow to firm, find a terminal value using the perpetuity growth method, and discount these values by the business's weighted average cost of capital.

For the case study in this chapter, assume that you've been provided with the projected financial model containing the financial statements for a company. It's your responsibility to perform a DCF analysis to arrive at a valuation for the business and ultimately a fair value for its equity shares.

Download the file File 1101.xlsx from <https://www.sequoiacpe.com/description?cn=4030&d=>, open it, and spend a few minutes reviewing and familiarizing yourself with the financial statements. In other courses, you build a financial model containing a full set of integrated financial statements, covering a 12-month period. To perform a DCF analysis, however, you need several years of financial statements, which are provided in this new model.

STEP 1: CALCULATING FREE CASH FLOW TO FIRM

The DCF will discount projected free cash flow that the business will earn, also called the *free cash flow to firm* (FCFF). A business's FCFF represents the cash flows the business will earn, disregarding cash flows associated with the capital structure, such as interest expense, debt paydown, dividends, or capital raises. The DCF yields the value of the whole business.

The financial model provided in File 1101.xlsx has a projection period of seven years for the business and includes the Income Statement, Cash Flow Statement, and Balance Sheet for this period. Your job is to calculate the projected FCFF and then use this to calculate the DCF.

Tip



There are different variations of the DCF that may use a different FCFF to discount. For instance, a levered free cash flow DCF may project a future capital structure for the business and project a *free cash flow to equity* (FCFE), which accounts for costs of financing like debt interest and paydown. In this chapter, I explain the more common method of discounting FCFF.

Although there are different ways to arrive at FCFF, a common equation derived from net income is the following:

$$\text{Free Cash Flow to Firm} = \text{Net Income} + \text{Depreciation and Amortization and Other Noncash Charges} + \text{Interest} * (1 - \text{tax rate}) - \text{Capital Expenditures} + \text{Change in Working Capital}$$

To calculate FCFF, follow these steps:

1. **Add depreciation and amortization and other noncash charges to the net income.**

These noncash expenses do not represent actual cash outflows from the business. Depreciation and amortization is the most common noncash expense to add back, but all other noncash expenses found in the income statement should be added back as well.

2. **Add the interest expense to the number you arrived at in Step 1.**