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DCF FROM

SCRATCH

Complete Guide to Discounted Cash Flow Valuation
30-Minute Tutorial with Practical Example

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Discounted Cash Flow (DCF) is the most robust and widely used method for valuing companies. It's based on a fundamental principle:

"The value of a company equals the present value of all its future cash flows"

In other words, a company is worth what it will be able to generate in cash in the future, adjusted for risk and the time value of money.

Why Use DCF?

- Most widely used method by professional analysts
- Based on real business fundamentals, not market multiples
- Allows understanding of a company's value drivers
- Provides intrinsic valuation independent of market sentiment

The 5 Steps of DCF

The DCF method can be summarized in 5 fundamental steps that we'll learn in detail:

Step 1: Project Free Cash Flows (FCF)

The first step is to project how much cash the company will generate in the coming years. Typically 5 to 10 years are projected.

Free Cash Flow Formula:

FCF = EBIT × (1 - Tax Rate) + D&A - CAPEX - Change in NWC

Where:

- **EBIT: Earnings Before Interest and Taxes (Operating Profit)**
- **D&A: Depreciation and Amortization (non-cash expense)**
- **CAPEX: Capital Expenditures (Investments)**
- **NWC: Net Working Capital**

Step 2: Calculate the WACC

WACC (Weighted Average Cost of Capital) is the discount rate we'll use. It represents the company's weighted average cost of capital.

WACC Formula:

WACC = (E/V × Re) + (D/V × Rd × (1 - Tc))

Where:

- **E/V: % of equity in the capital structure**
- **Re: Cost of equity (calculated with CAPM)**
- **D/V: % of debt in the capital structure**
- **Rd: Cost of debt**
- **Tc: Tax rate**

Step 3: Discount the Cash Flows

Once we have the projected FCF and WACC, we discount each future flow to present value:

$PV = FCF / (1 + WACC)^n$

Where n is the projection year (1, 2, 3, etc.).

Step 4: Calculate Terminal Value

Terminal Value represents the value of all cash flows after the explicit projection period. It usually represents 60-80% of the total value.

Perpetuity Method (most common):

$\text{Terminal Value} = FCF\_final \times (1 + g) / (WACC - g)$

Where g is the perpetual growth rate (typically 2-3%).

Step 5: Sum Everything and Calculate Enterprise Value

Enterprise Value = Suma de todos los PV de los FCF + PV del Terminal Value

To arrive at Equity Value (value for shareholders):

Equity Value = Enterprise Value + Cash - Debt

Practical Example: TechCorp

Let's value a fictitious company called TechCorp using the DCF method. This example is included in the attached Excel file.

TechCorp Data

- Current EBIT: $100 million
- EBIT growth rate: 10% annually
- Stable EBIT margin: 25%
- Tax rate: 25%
- D&A: 5% of revenue
- CAPEX: 4% of revenue
- Change in NWC: 2% of revenue change
- WACC: 9%
- Perpetual growth rate: 2.5%
- Debt: $200 million
- Cash: $50 million

Step-by-Step Calculation

1. We project FCF for 5 years

Año 1: EBIT = $110M → FCF = $72.9M

Año 2: EBIT = $121M → FCF = $80.2M

Año 3: EBIT = $133M → FCF = $88.2M

Año 4: EBIT = $146M → FCF = $97.0M

Año 5: EBIT = $161M → FCF = $106.7M

2. We discount each FCF to present value (WACC = 9%)

PV Año 1 = $72.9M / 1.09^1 = $66.9M

PV Año 2 = $80.2M / 1.09^2 = $67.5M

PV Año 3 = $88.2M / 1.09^3 = $68.1M

PV Año 4 = $97.0M / 1.09^4 = $68.7M

PV Año 5 = $106.7M / 1.09^5 = $69.4M

Suma de PV FCF = $340.6M

3. We calculate Terminal Value

Terminal Value = $106.7M × (1 + 0.025) / (0.09 - 0.025) = $1,682M

PV del Terminal Value = $1,682M / 1.09^5 = $1,093M

4. We calculate Enterprise Value

Enterprise Value = $340.6M + $1,093M = **$1,433.6M**

5. We calculate Equity Value

Equity Value = Enterprise Value + Cash - Debt

Equity Value = $1,433.6M + $50M - $200M = **$1,283.6M**

TechCorp is worth $1,283.6 million!

Sensitivity Analysis

A company's DCF value is very sensitive to key assumptions. You should always perform sensitivity analysis by varying:

- **WACC: ±1-2% can change value by 15-30%**
- **Perpetual growth rate: ±0.5% can change value by 10-20%**
- **Revenue growth: Directly impacts FCF**
- **Margins: Small changes have large impact**

Practical Tips

For Projections

- Use historical data as a base, but adjust for the future
- Be conservative in your growth assumptions
- Project 5-10 years (5 is most common)
- Maintain consistency between drivers (e.g., if sales grow, CAPEX should too)

For WACC

- Use betas from comparable companies in the sector
- For the risk-free rate, use 10-year treasury bonds
- Typical equity risk premium is 5-6%
- Typical WACC: Startups 15-25%, Mature companies 7-10%

For Terminal Value

- Perpetual rate should be ≤ GDP growth (2-3%)
- Terminal value is usually 60-80% of total value
- If >85%, review your explicit projections

Common Errors to Avoid

1. Using EBITDA Instead of FCF

DCF is done with Free Cash Flow, not EBITDA. FCF considers taxes, CAPEX, and working capital.

2. Overly Optimistic Projections

Perpetual growth of 20-30% is unrealistic. Be conservative.

3. Not Performing Sensitivity Analysis

ALWAYS do sensitivity analysis. A valuation is a range, not an exact number.

4. Forgetting to Adjust for Cash and Debt

DCF gives you Enterprise Value. You must adjust to arrive at Equity Value.

5. Using the Wrong Rate

Use WACC to value the entire company, not the cost of equity.

Next Steps

Now that you understand DCF fundamentals, we recommend:

1. Open the attached Excel file and review the complete TechCorp model
2. Modify assumptions and observe how the valuation changes
3. Practice with a real company of interest
4. Compare your valuation with market price and analyze differences

Recommended References

Damodaran, A. (2012). Investment valuation: Tools and techniques for determining the value of any asset (3rd ed.). Wiley.

Koller, T., Goedhart, M., & Wessels, D. (2020). Valuation: Measuring and managing the value of companies (7th ed.). Wiley.

Rosenbaum, J., & Pearl, J. (2013). Investment banking: Valuation, leveraged buyouts, and mergers & acquisitions (2nd ed.). Wiley.

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