

Question: The following information is provided for a company.

FCFF = 700 million

FCFE = 620 million

Before tax cost of debt = 5.7%

Required rate of return of equity = 11.8%

Target capital structure = 20% debt and 80% equity

Tax rate = 33.33%

FCFF is expected to grow at 5% forever

Market value of outstanding debt = 2.2 billion

No of outstanding common shares = 200 million

Calculate WACC.

Calculate equity value using FCFF approach.

Calculate value per share.

Answer:

1. $WACC = 0.20(5.7\%)(1 - 0.3333) + 0.80(11.8\%) = 10.2\%$

2. $Firm\ value = \frac{FCFF_0(1 + g)}{WACC - g} = \frac{700(1.05)}{0.102 - 0.05} = 14,134.6\ million$

Equity value = $14,134.6 - 2,200 = 11,934.6\ million$

3. $Value\ per\ share = 11,934.6\ million / 200\ million = 59.67\ per\ share$

Question: The following information is provided for a company. Starting with net income, calculate FCFF for 2010.

2010 Income Statement (in Thousands)

Earnings before interest, taxes, depreciation, and amortization (EBITDA): 200.00

Depreciation expense: 45.00

Operating income: 155.00

Interest expense (at 7 percent): 15.68

Income before taxes: 139.32

Income taxes (at 30 percent): 41.80

Net income: 97.52

2009 and 2010 Balance Sheet (in Thousands)

2009:

Cash: 0.00

Accounts receivable: 0.00

Inventory: 60.00

Current assets: 60.00

Fixed assets: 500.00

Less: Accumulated depreciation: 0.00

Total assets: 560.00

Accounts payable: 0.00

Current portion of long-term debt: 0.00

Current liabilities: 0.00

Long-term debt: 224.00

Common stock: 336.00

Retained earnings: 0.00

Total liabilities and equity: 560.00

2010:

Cash: 108.92

Accounts receivable: 100.00

Inventory: 56.00

Current assets: 274.92

Fixed assets: 500.00

Less: Accumulated depreciation: 45.00

Total assets: 729.92

Accounts payable: 50.00

Current portion of long-term debt: 0.00

Current liabilities: 50.00

Long-term debt: 246.40

Common stock: 336.00

Retained earnings: 97.52

Total liabilities and equity: 729.92

Answer:

$FCFF = NI + NCC + \text{Int}(1 - \text{Tax rate}) - FCInv - WCInv$

$FCFF = 97.52 + 45 + 15.68(1 - 0.3) - 0.00 - 56.00 = 97.50$

Here,

Depreciation expense of 45 is the only NCC.

Fixed assets have remained constant at 500. Hence, $FCInv = \Delta \text{ Fixed assets} = 0$

$WC \text{ in } 2009 = AR + Inv - AP = 0 + 60 - 0 = 60$

$WC \text{ in } 2010 = AR + Inv - AP = 100 + 66 - 50 = 116$

$WCInv = \Delta WC = 116 - 60 = 56$

Question: The following information is provided for a company reporting under US GAAP. Using CFO as a starting point calculate FCFF for 2012.

Statement of cash flows: Indirect method (In Thousands)

the cash flow statement for the year ending 31st December 2012:

Cash flow from operations

Net income: \$118.00

Plus: Depreciation: 54.45

Increase in accounts receivable: (11.00)

Increase in inventory: (7.26)

Increase in accounts payable: 5.50

Total cash flow from operations: 159.69

Cash flow from investing activities

Purchases of PP&E: (55.00)

Cash flow from financing activities

Borrowing (repayment): 27.10

Total cash flow: 131.80

Beginning cash: 228.74

Ending cash: 360.54

Notes:

Cash paid for interest: (\$18.97)

Cash paid for taxes: (\$50.57)

Tax rate: 30%

Answer: US GAAP classifies interest expense as an operating cash flow. Therefore, no changes are required to the formula and we can calculate FCFF as:

$FCFF = CFO + Int(1 - \text{Tax rate}) - FCInv$

$FCFF = 159.69 + 18.97(1 - 0.30) - 55 = 117.98$

Question: Calculate FCFF and FCFE:

Starting with EBIT.

2. Starting with EBITDA.

The following information is provided for a company.

a balance sheet with financial data for the years ended 31st December 2011 and 2012
(in US\$ Millions):

2011:

Cash: 190

Accounts receivable: 560

Inventory: 410

Current assets: 1,160

Fixed assets: 2,200

Less accumulated depreciation: (900)

Total assets: 2,460

Accounts payable: 285

Notes payable: 200

Accrued expenses: 140

Total current liabilities: 625

Long-term debt: 865

Common stock: 100

Additional paid-in capital: 200

Retained earnings: 670

Total liabilities & equity: 2,460

2012:

Cash: 200

Accounts receivable: 600

Inventory: 440

Current assets: 1,240

Fixed assets: 2,600

Less accumulated depreciation: (1,200)

Total assets: 2,640

Accounts payable: 300

Notes payable: 250

Accrued expenses: 150

Total current liabilities: 700

Long-term debt: 890

Common stock: 100

Additional paid-in capital: 200

Retained earnings: 750

Total liabilities & equity: 2,640

An income statement for the year ended 31st December 2012 (in US\$ Millions):

Total revenues: 3,000

Operating costs: 2,200

EBITDA: 800

Depreciation: 300

EBIT (Earnings Before Interest and Taxes): 500

Interest expense: 100

EBT (Earnings Before Taxes): 400

Taxes (@40%): 160

Net Income: 240

Dividends: 160

Answer: We first calculate FCInv, WCInv and net borrowing

$$\text{FCInv} = \Delta \text{ Fixed assets} = 2,600 - 2,200 = 400$$

$$\text{WCInv} = \Delta \text{ WC (Ignoring cash and short-term debt)} \quad \text{NWC}_{\text{Beg}} = (560+410) - (285+140) = 545$$

$$\text{NWC}_{\text{End}} = (600+440) - (300+150) = 590$$

$$\text{WCInv} = 590 - 545 = 45$$

Net borrowing: Because notes payable increased by \$50 million (\$250 million – \$200 million) and long-term debt increased by \$25 million (\$890 million – \$865 million), net borrowing is \$75 million

$$\text{FCFF} = \text{EBIT}(1 - \text{Tax rate}) + \text{Dep} - \text{FCInv} - \text{WCInv} \quad \text{FCFF} = 500(1 - 0.40) + 300 - 400 - 45 = \$155 \text{ million}$$

$$\text{FCFE} = \text{FCFF} - \text{Int}(1 - \text{Tax rate}) + \text{Net borrowing} \quad \text{FCFE} = 155 - 100(1 - 0.40) + 75 = \$170 \text{ million}$$

$$\text{FCFF} = \text{EBITDA}(1 - \text{Tax rate}) + \text{Dep}(\text{Tax rate}) - \text{FCInv} - \text{WCInv} \quad \text{FCFF} = 800(1 - 0.40) + 300(0.40) - 400 - 45 = \$155 \text{ million}$$

$$\text{FCFE} = \text{FCFF} - \text{Int}(1 - \text{Tax rate}) + \text{Net borrowing} \quad \text{FCFE} = 155 - 100(1 - 0.40) + 75 = \$170 \text{ million}$$

Question: The following information is provided for a company:

Sales in 2012 were \$3,000 million and are expected to increase by 10% in 2013

Sales grew by \$300 million from 2011 to 2012

Working capital grew by \$45 million from 2011 to 2012

Historical EBIT margin of 16.67% will be maintained

2012 statement of cash flows show capital expenditures of \$400 million and depreciation of \$300 million.

Tax rate is 40% Forecast FCFF for 2013.

Answer:

Incremental fixed capital investment in 2012 was:

$$\frac{\text{Capital expenditures} - \text{Depreciation expense}}{\text{Increase in sales}} = \frac{400 - 300}{300} = 33.33\%$$

Incremental working capital investment in 2012 was:

$$\frac{\text{Increase in working capital}}{\text{Increase in sales}} = \frac{45}{300} = 15\%$$

So, for every \$100 increase in sales, the company invests \$33.33 in new equipment in addition to replacement of depreciated equipment and \$15 in working capital.

FCFF for 2013 can be forecasted as:

$$\text{FCFF} = \text{EBIT} (1 - \text{tax rate}) - \Delta \text{FCInv} - \Delta \text{WCInv}$$

Sales: \$3,300 (Up 10 percent)

EBIT: 550 (16.67 percent of sales)

EBIT(1 - Tax rate): 330 (Adjusted for 40 percent tax rate)

Incremental FC (Fixed Costs): (100) (33.33 percent of sales increase)

Incremental WC (Working Capital): (45) (15 percent of sales increase)

FCFF (Free Cash Flow to Firm): \$185

Question: For the same company from the previous example, the following additional information is provided:

Profit margin will remain at 8%

the company will finance incremental fixed and working capital investments with 50% debt, the target DR

Forecast FCFE for 2013.

Answer: Sales: \$3,300 (Up 10 percent)

NI (Net Income): 264 (8.0 percent of sales)

Incremental FC (Fixed Costs): (100) (33.33 percent of sales increase)

Incremental WC (Working Capital): (45) (15 percent of sales increase)

FCFE for 2013 can be forecasted as:

$$\text{FCFE} = \text{NI} - (1 - \text{DR}) (\text{FCinv} - \text{Dep}) - (1 - \text{DR}) (\text{WCInv})$$

$$\text{FCFE} = 264 - (1 - 0.5) (100) - (1 - 0.5) (45) = \$191.50 \text{ million}$$

Question: A company uses bond, preferred stock, and common stock financing. The market value of each of these sources of financing and the before-tax required rates of return for each are given below:

Bonds: Market Value (in \$ Millions) - 400, Required Return (%) - 8.0

Preferred stock: Market Value (in \$ Millions) - 100, Required Return (%) - 8.0

Common stock: Market Value (in \$ Millions) - 500, Required Return (%) - 12.0

Total: Market Value (in \$ Millions) - 1,000

Other financial information (in \$ millions):

- Net income available to common shareholders = \$110.

- Interest expenses = \$32.

Preferred dividends = \$8.

- Depreciation = \$40.
- Investment in fixed capital = \$70.
- Investment in working capital = \$20.
- Net borrowing = \$25.
- Tax rate = 30 percent.
- Stable growth rate of FCFF = 4.0 percent.
- Stable growth rate of FCFE = 5.4 percent.

1. Calculate the company's WACC.
2. Calculate the current value of FCFF.
3. Based on forecasted Year 1 FCFF, what is the total value of the company and the value of its equity?
4. Calculate the current value of FCFE.
5. Based on forecasted Year 1 FCFE, what is the value of equity?

Answer:

Solution to 1:

$$\text{WACC} = \frac{400}{1,000} 8\% (1 - 0.03) + \frac{100}{1,000} 8\% + \frac{500}{1,000} 12\% = 9.04\%$$

Solution to 2:

If the company did not issue preferred stock, FCFF would be

$$\text{FCFF} = \text{NI} + \text{NCC} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv} - \text{WCInv}$$

If preferred stock dividends have been paid (and net income is income available to common shareholders), the preferred dividends must be added back just as after-tax interest expenses are. The modified equation (including preferred dividends) for FCFF is

$$\text{FCFF} = \text{NI} + \text{NCC} + \text{Int}(1 - \text{Tax rate}) + \text{Preferred dividends} - \text{FCInv} - \text{WCInv}$$

$$\text{FCFF} = 110 + 40 + 32(1 - 0.30) + 8 - 70 - 20 = \$90.4 \text{ million}$$

Solution to 3:

$$\text{Firm value} = \frac{\text{FCFF}_1}{\text{WACC} - g} = \frac{90.4(1.04)}{0.0904 - 0.04} = \$1,865.40 \text{ million}$$

The value of (common) equity is the total value of the company minus the value of debt and preferred stock:

$$\text{Equity} = 1,865.40 - 400 - 100 = \$1,365.40 \text{ million}$$

Solution 4: With no preferred stock, FCFE is

$$\text{FCFE} = \text{NI} + \text{NCC} - \text{FCInv} - \text{WCInv} + \text{Net borrowing}$$

If the company has preferred stock, the FCFE equation is essentially the same. Net borrowing in this case is the total of new debt borrowing and net issuances of new preferred stock.

$$\text{FCFE} = 110 + 40 - 70 - 20 + 25 = \$85 \text{ million}$$

Solution to 5:

$$\text{Equity value} = \frac{\text{FCFE}_1}{r - g} = \frac{85(1.054)}{0.12 - 0.054} = \$1,357.42 \text{ million}$$

Question: The following information is provided for a company operating in a high inflation country.

- FCFE per share for the year just ended = 7.05
- Real country return = 7.3%. Adjustments to the country return for this company are an industry adjustment of + 0.80%, a size adjustment of -0.33 %, and a leverage adjustment of -0.12 %
- Long term real growth rate of the country = 3.0%. The real growth rate for the company is expected to be about 0.5 percent below the country rate
- Calculate the value of each share.

Answer:

The company's real required rate of return is:

Country return (real)	7.30%
Industry adjustment	+ 0.80%
Size adjustment	- 0.33%
Leverage adjustment	<u>- 0.12%</u>
Required rate of return	7.65%

The real growth rate of FCFE is expected to be 2.5 percent (3.0 percent - 0.5 percent), so the value of one share is:

$$V_0 = \frac{FCFE_0(1 + g_{\text{real}})}{r_{\text{real}} - g_{\text{real}}} = \frac{7.05(1.025)}{0.0765 - 0.025} = 140.32$$