

- ▶ Echinox, a maker of sports equipment, is attempting to estimate its cost of capital. Echinox could issue additional debt at a cost of 9%; its ratio of debt to total assets is 40% and Echinox is subject to a 35% tax rate. Echinox estimates its cost of equity capital at 20%.
- ▶ 1. What is Echinox weighted average cost of capital (WACC)?
- ▶ 2. If Echinox reassessed its capital structure and decided its target debt/total assets (D/V) ratio would be 75%, what would its cost of capital be (keep debt and equity returns unchanged)? What conclusions could you draw about the amount of debt financing Echinox should have? What critical and wrong assumption is involved in this conclusion?
- ▶ Echinox reassessed the required rate of return on its securities when it changed its capital structure. The Table below shows the revised figures.
- ▶ 3. What capital structure would you recommend? Why?
- ▶ 4. Could you say that, in the case depicted here above, the M&M model holds completely? Think about the trade-off theory and the present value of financial distress costs.

kD	9%
D/V	40%
T	35%
kE	20%

D/V	20%	30%	40%	50%	60%	70%
kD	8%	8%	9%	10%	13%	15%
kE	18.08%	19.09%	20.00%	21.01%	24.50%	28.00%

Answer 1

WACC 14.34%

Answer 2

D/V 75%
WACC 9.39%

WRONG conclusion. It would be optimal to have D/V = 100%; in that case WACC = 5.85 and V^L is maximum.

Answer 3

D/V	20%	30%	40%	50%	60%	70%
kD	8%	8%	9%	10%	13%	15%
kE	18.08%	19.09%	20.00%	21.01%	24.50%	28.00%
WACC	15.50%	14.92%	14.34%	13.76%	14.87%	15.23%

Choose D/V = 50% because WACC is minimum.

Answer 4

kU 16.67% Inverting MM II proposition with taxes

D/V	20%	30%	40%	50%	60%	70%
kD	8%	8%	9%	10%	13%	15%
kE	18.08%	19.09%	20.00%	21.01%	24.50%	28.00%
WACC	15.50%	14.92%	14.34%	13.76%	14.87%	15.23%
kE MM	18.08%	19.09%	20.00%	21.01%	20.26%	19.21%
WACC MM	15.51%	14.92%	14.34%	13.76%	13.17%	12.59%

Beyond D/V = 50% raising debt is value destroying (financial distress costs).

- ▶ The following table reports the projected cash flows to equity and to the firm over the next five years.
- ▶ (The terminal value is the value of the equity or firm at the end of year 5.)
- ▶ The firm has a cost of equity of 12% and a WACC of 9.94%. Answer the following questions.
- ▶ 1. What is the value of the equity in this firm?
- ▶ 2. What is the value of the firm?

Year	CFE	Int (1 - T)	CFF
1	250.00	90.00	340.00
2	262.50	94.50	357.00
3	275.63	99.23	374.86
4	289.41	104.19	393.60
5	303.88	109.40	413.28
TV	3946.50		6000.00

Answer 1

kE 12%

Year	CFE	DCFCE
1	250.00	223.21
2	262.50	209.26
3	275.63	196.19
4	289.41	183.93
5	303.88	172.43
TV	3946.50	2239.35

Equity 3224.37

Answer 2

WACC 9.94%

Year	CFF	DCFCE
1	340.00	309.26
2	357.00	295.36
3	374.86	282.10
4	393.60	269.42
5	413.28	257.32
TV	6000.00	3735.71

Firm 5149.16

- ▶ You are estimating the price/earnings multiple to use to value Paramount Corporation, by looking at the average price/earnings multiple of comparable firms. The following are the price/earnings ratios of firms in the entertainment business.
- ▶ 1. What is the average P/E ratio?
- ▶ 2. Would you use all the comparable firms in calculating the average?
- ▶ 3. What assumptions are you making when you use the industry-average P/E ratio to value Paramount Communications?
- ▶ 4. Suppose that Paramount Communications has an expected EPS of \$0.40; what is the value of a share?

Firm	P/E
Walt Disney	22.09
Time Warner	36.00
King World Prod.	14.10
New Line Cinema	26.70
CCL	19.12
PLG	23.33
CIR	22.91
GET	97.60
GTK	26.00

Answer 1

Average P/E 31.98

Answer 2

No. Eliminate the outliers, as they are likely to skew the average. The average P/E without GET and King World is:

Average P/E 25.16

Answer 3

You are assuming that:

- Paramount is similar to the average firm in the industry in terms of growth and risk.
- The market is valuing communications firms correctly, on average.

EPS 0.4
 Value per share 10.07

- ▶ You have the following financial and accounting data of BMAS Ltd, a consultancy company:
- ▶ current working capital € 10 million and in general equal to one fifth of revenues;
- ▶ next year's revenues are expected to be € 100 million, growing at a pace of € 50 million per year for the following 5 years; constant thereafter;
- ▶ operating costs equal to 50% of revenues;
- ▶ D&A equal to € 25 million each year (no CAPEX is required for years 1-5; CAPEX = D&A = € 25 million thereafter);
- ▶ tax rate = 40% and WACC = 10%.
- ▶ Calculate:
- ▶ free cash flow to firm;
- ▶ the value of the firm;
- ▶ the value of equity assuming NFP equal to 182.

Answer 1

	1	2	3	4	5	6
Revenues	100.00	150.00	200.00	250.00	300.00	300.00
Operating costs	50.00	75.00	100.00	125.00	150.00	150.00
EBITDA	50.00	75.00	100.00	125.00	150.00	150.00
D&A	25.00	25.00	25.00	25.00	25.00	25.00
EBIT	25.00	50.00	75.00	100.00	125.00	125.00
Taxes	10.00	20.00	30.00	40.00	50.00	50.00
NOPAT	15.00	30.00	45.00	60.00	75.00	75.00
WC	10.00	20.00	30.00	40.00	50.00	60.00
Change in WC	10.00	10.00	10.00	10.00	10.00	0.00
D&A	25.00	25.00	25.00	25.00	25.00	25.00
CAPEX						25.00
FCFF	30.00	45.00	60.00	75.00	90.00	75.00

Answer 2

WACC	10.00%
Value 1-5	€ 216.65 million
DTV	€ 465.69 million
Firm's value	€ 682.34 million

Answer 3

Debt	€ 182.00 million
Equity	€ 500.34 million

- ▶ Ryder System is a full-service truck leasing, maintenance, and rental firm with operations in North America and Europe. The following are selected numbers from the financial statements for year 1 (Y1) and year 2 (Y2) (in millions).
- ▶ The firm had capital expenditures of \$800 million in Y1 and \$850 million in Y2. The working capital in Y0 was \$34.8 million, and the total debt outstanding in Y0 was \$1.75 billion.
- ▶ 1. Estimate the cash flows to equity (FCFE) in Y1 and Y2.
- ▶ 2. Estimate the cash flows to the firm (FCFF) in Y1 and Y2.

	Y1	Y2
Revenues	5192.00	5400.00
Operating expenses	-3678.50	-3848.00
D&A	-573.50	-580.00
EBIT	940.00	972.00
Interest expenses	-170.00	-172.00
Taxes	-255.00	-280.00
Net income	515.00	520.00
WC	92.00	-370.00
Total debt	2000.00	2200.00

Answer 1

Tax rate	33.12%	35.00%
CAPEX	800.00	850.00
Delta WC	57.20	-462.00

	Y1	Y2
Revenues	5192.00	5400.00
Operating expenses	-3678.50	-3848.00
EBITDA	1513.50	1552.00
D&A	-573.50	-580.00
EBIT	940.00	972.00
Taxes	-311.30	-340.20
NOPAT	628.70	631.80
Investment in WC	-57.20	462.00
net CAPEX	-226.50	-270.00
FCFF	345.00	823.80

Answer 2

	Y1	Y2
FCFF	345.00	823.80
Interest expenses	-170.00	-172.00
Tax shield	56.30	60.20
Change in debt	250.00	200.00
FCFE	481.30	912.00

- ▶ CLAMDA is a publicly traded steel company with 20 million shares outstanding, trading at €2.00 per share, and €60.00 million in outstanding debt. The firm is expected to generate €16.00 million in net operating income (EBIT) next year and is considered to be in steady state ($g = 0$ in perpetuity). The tax rate is equal to 40%.
- ▶ 1. Assuming that the firm is correctly valued by the market now, estimate the opportunity cost of capital (WACC) that the firm is expected to generate in perpetuity.
- ▶ Suppose the firm keeps a constant level of debt over time, and the bondholders charge a cost of debt equal to 6%.
- ▶ 2. Estimate the firm's next year free cash flow to equity (FCFE).
- ▶ 3. Compute the opportunity cost of equity consistent with market value of the firm.
- ▶ 4. Compute the unlevered cost of capital via Modigliani and Miller (1963) delevering formula and comment the result.

Answer 1

N	20.00 million shares
PPS	€ 2.00
Debt	€ 60.00 million
EBIT(1)	€ 16.00 million
g	0.00%
T	40.00%
Equity	€ 40.00 million
Debt	€ 60.00 million
Value	€ 100.00
WACC	9.60%

Answer 2

kD	6%
Interest expense	€ 3.60 million
FCFE	€ 7.44 million

Answer 3

kE	18.60%
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Answer 4

kU	12.63%
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- ▶ BMF S.p.A. is a pharmaceutical firm listed at the Italian Stock Exchange. Market data regarding BMF and the Italian financial market are shown in the Table below.
- ▶ BMF has no financial debt and the marginal tax rate is 34%. From the firm's accounts you compute BMF's last year FCFF, equal to €16.23 million.
- ▶ 1. Estimate BMF's WACC.
- ▶ 2. Compute the growth rate implied by the market value of the firm.
- ▶ Now assume that BMF pays out 10% of its current share price as an extraordinary dividend to its shareholders, and contemporarily takes a 5-year bank loan (bullet form) of the same amount. On this loan, the bank charges the 5-year Treasury bond rate plus 100 basis points.
- ▶ 3. Compute the value of tax shields from debt granted by the change in the firm's capital structure.
- ▶ 4. Estimate the new BMF's WACC.

Number of shares	110.15
Last price	3.7
Beta	1.17
MRP	4.90%
1y T-rate	0.90%
2y T-rate	1.30%
5y T-rate	1.53%
10y T-rate	2.20%
30y T-rate	2.87%

Answer 1

FCFF(0)	€ 16.23 million
T	34%
kE	7.93%
WACC	7.93%

Answer 2

E	€ 407.56 million
g	3.80%

$$V = \frac{FCFF(1+g)}{WACC - g}$$

$$g = \left(WACC - \frac{FCFF}{V} \right) / \left(1 + \frac{FCFF}{V} \right)$$

Answer 3

Extraord. dividend	€ 40.76 million	
Debt	€ 40.76 million	
kD	2.53%	
Interest expenses	€ 1.03 million	
Tax shield	€ 0.35 million	
Annuity factor	4.64	
VTS	€ 1.63 million	
VTS	€ 13.86 million	in case of perpetuity

Answer 4

V	€ 409.18 million	
WACC	7.92%	
V	€ 421.41 million	in case of perpetuity
WACC	7.80%	in case of perpetuity