# Chapter 25

25-1

a. It should have no effect on value, since expected cash flows are unchanged by the announcement.

b. The stock price might be affected. To the extent that investors form expectations based upon what they know about the firm, this action might lower expectations for the future and reduce the perceived value. The fact that value does not change but price may drop reflects the likelihood that this stock was over valued before it announced the restructuring.

25-2

a.

| (in billions) | Pre-cutting | Post-cutting |
|---|---|---|
| Revenues | 10 | 10 |
| Operating Income | 0.3 | 0.4 |

Change in operating income = 100 million

Change in after-tax operating income = 100 (1-.4) = 60

Present value of savings over time = 60(1.05)/(.10 - .05) = $ 1,260.00

b. Value of firm before cost-cutting = (300(1-.4))(1.05)/(.10-.05) = 3780

Value of firm after cost cutting = (400(1-.4))(1.045)/(.10-.045) = 4560

Change in firm value = $780.00

25-3

a. Cost of capital = 12% (.6) + 8% (1-.4) (.4) = 9.12%

Value of firm = (100*(1-.4)-25) (1.04)/(.0912-.04) = $ 710.94

b. With a 0% tax rate, Cost of capital = 12% (.6) + 8%(.4) = 10.40%

Value of firm = (100 –25) (1.04)/(.104-.04) = $ 1,218.75

25-4

a.

| | | |
|---|---|---|
| EBIT (1-t) | $ | 262.50 |
| - Net Cap Ex | $ | 105.00 |
| - Chg in WC | $ | 50.00 |
| FCFF | $ | 107.50 |

Value of firm = 107.5/(.09-.05) = $2687.50

b. With 50% lower WC requirement

| | | |
|---|---|---|
| EBIT (1-t) | $ | 262.50 |
| - Net Cap Ex | $ | 105.00 |
| - Chg in WC | $ | 25.00 |
| FCFF | $ | 132.50 |

Value of firm = 132.5/(.09-.05) = $3,312.50

Change in value of firm = $625.00. In fact, if the working capital change applied to existing working capital as well, there will be an additional one-time cash inflow of $ 500 million (50% of $ 1 billion).

c. Effect of lower growth

| | | |
|---|---|---|
| EBIT (1-t) | $ | 261.88 |
| - Net Cap Ex | $ | 104.75 |
| - Chg in WC | $ | 23.75 |
| FCFF | $ | 133.38 |

Value of firm = 133.38/(.09-.0475) = $3,138.24
Change in value = $ 450.74

25-5
Return on capital = 50/250 = 20%
Reinvestment rate = 25/50 = 50%
a. Expected Growth rate = 0.5*0.2 = 10.0%
b. Expected Growth rate with higher reinvestment rate = 0.8 *.20 = 16%
c. Expected Growth rate with lower return on capital = 0.8*.15 = 12%

25-6
a. Expected Growth = Reinvestment rate x Return on capital = 50% x 10.69% = 5.35%
Cost of capital = Cost of equity = 11.5%
b. Value of firm = $ 2 billion (1 – Reinvestment Rate) (1+g)/(Cost of capital –g) = $16.25 billion
With no growth and reinvestment, Compaq's value is $ 2 billion/.115 = 17.39
Value destroyed by new investments = $ 17.39 - $ 16.25 = $1.14

25-7
a. Expected Growth rate = 5.35% (Nothing changes)
b. Cost of capital = 12.5% (0.8) + 4.5% (0.2) = 10.90%
Value of firm = $ 2 (1-.5)/(0.109-.0535) = $18.00
c. Value of firm with no growth or reinvestment = $18.35
Value destroyed by new investments = $0.35

25-8
a. Return on Capital = (0.2)(25)/5 = 100%
Reinvestment rate = 50%
Expected growth in Operating income = 50.00%
b. Return on capital with generic margins = 0.075(25)/5 = 37.5%
Expected growth in operating income = 18.75%

25-9
Value of firm with no advertising campaign (10 million growing at15% for 3 years, constant forever thereafter) = $147.08
Value of firm with advertising campaign = PV(10 million growing 15% for 10 years, constant forever thereafter) - PV of Cost of advertising campaign = $160.37

To solve for the probability
Increase in value from advertising = Value of firm with advertising - Value of firm without advertising = $ 137.64
Present value of advertising cost = PV of $ 50 million for 3 years = $124.34
Probability of success needed = X (137.64) = 124.34
Probability = 90.34%

25-10
Return on capital = After-tax Operating Margin * Sales/Capital = 7.50%
Reinvestment rate = 60%
Expected growth = 4.500%
a. Value of firm = 300 (1-.6) (1.045)/(.10 -.045) = $ 2,280.00
b. New return on capital = 5% *2.5 = 12.50%
Reinvestment rate = 40%
Expected growth = 5.00%
Value of firm = 300 (1-.4)(1.05)/(.09-.05) = $4,725.00
Change in firm value = $2,445.00

25-11
Book value of equity at start of year = 1,250 – 50 = $1200 (after subtracting out retained earnings of $50 million)
Book value of debt at start of year = 350 – 50 = $300
Book value of capital at start of year = $1500
a. Return on capital = 180/1500 = 12%
b. Cost of capital = 12%(2500/(2500 + 350))+ 5% (350/(2500+350)) = 11.14% (Note that the market value of equity was double the book value at the end of 1998.)
c. EVA = (.12 -.1114) (1500) = $12.89

25-12
PV of EVA over time = 12.89 (1.05)/(.1114-.05) = $220.43
Capital invested in firm = $1600
a. Value of firm = $1820.43
b. Portion of value from excess returns = $220.43
c. Market value added at this firm = $220.43
d. PV of EVA for next 5 years = 12.89 growing at 5% for next 5 years = $54.52
Value of firm = 1600 + 54.52 = $1654.52
Portion of value from excess returns = $54.52
Market value added at this firm = $54.52

25-13

| Year | Operating lease commitment | PV of commitment |
|---|---|---|
| 1 | 55 | $ 51.89 |
| 2 | 60 | $ 53.40 |
| 3 | 60 | $ 50.38 |
| 4 | 55 | $ 43.57 |

| | | |
|---|---|---|
| 5 | 50 | $ 37.36 |
| yr 6-15 | 40 | $ 220.00 |
| | | $ 456.59 |

Capital invested before operating leases (in millions) = $ 1,000.00
Capital invested after operating leases = $ 1,456.59

Operating income before operating lease adjustment = $150
Operating income after operating lease adjustment = $177.40

Return on capital before lease adjustment = 9%
Return on capital after lease adjustment = 7.31%

Cost of capital before lease adjustment = 11%
Cost of capital after = 11%(2/2.457)+6%(1-.4)(.457/2.457) = 9.62%

EVA before lease adjustment = (.09-.11) (1000) = -$20.00
EVA after lease adjustment = (.0731-.0962) (1457) = -$33.74

25-14
Return on capital = 1/5 = 20%
Cost of capital = .12(.75) + .045(.25) = 10.125%
a. EVA = (.20 - .1025) (1000) = $ 97.50
b. Return on capital for the industry = 22.22%
EVA based on industry numbers = (.2222-.10) (1000) = $122.22
c. Sevilla underperformed the industry

25-15
a. EVA this year = 20 million - 60*.15 = $11.00
PV of EVA over next 5 years = $55.00 (note that the growth and discount rates offset each other.
Capital invested = $60.00
Value of firm = $115.00

b. EVA this year = 20 million - 40*0.15 = $14
PV of EVA over next 5 years = $70.00
Capital invested = $40.00
Value of firm = $110.00

25-16
Gross Investment before inflation adjustment = $150
Gross Investment after inflation adjustment = $150 $(1.02)^5$ = $ 165.61
After-tax Operating Income each year = $ 20.00
Salvage Value = $50.00
Life of assets = 10 + 5 = 15
Solve for IRR, with PV=165.61, PMT=15, FV=50 and n=15

| Year | Flow |
|---|---|
| 0 | $ (165.61) |
| 1 | $ 20.00 |
| 2 | $ 20.00 |
| 3 | $ 20.00 |
| 4 | $ 20.00 |
| 5 | $ 20.00 |
| 6 | $ 20.00 |
| 7 | $ 20.00 |
| 8 | $ 20.00 |
| 9 | $ 20.00 |
| 10 | $ 20.00 |
| 11 | $ 20.00 |
| 12 | $ 20.00 |
| 13 | $ 20.00 |
| 14 | $ 20.00 |
| 15 | $ 70.00 |

CFROI = 9.85%

b. With economic depreciation method
Economic Depreciation = (165.61-50)*0.0784/[($1.0784^{15}$)-1] = $4.31
Adjusted CFROI = (20-4.31)/165.61= 9.47%
c. Real cost of capital = (1.10/1.02)-1 = 7.84%
The firm's CFROI exceeds its real cost of capital. It is taking good projects.