

CHAPTER 22

VALUING FIRMS WITH NEGATIVE EARNINGS

Problem 1

A.

<i>Year</i>	<i>EPS</i>
1984	\$0.69
1985	\$0.71
1986	\$0.90
1987	\$1.00
1988	\$0.76
1989	\$0.68
1990	\$0.09
1991	\$0.16
1992	(\$0.07)
1993	(\$0.15)

Average Earnings Per Share = \$0.48

Normalized Earnings Per Share in 1994 = $\$0.48 * 1.06 = \0.51

B.

Normalized Earnings Per Share =	\$0.51
- (Cap Ex - Deprec'n) * (1 - Debt ratio) =	\$0.25
- Δ Working Capital * (1 - Debt ratio) =	\$0.06
Normalized FCFE Next Year	\$0.19

=

(Assume that capital expenditures and depreciation will grow 6% in 1994.)

Problem 2

A.

Total Assets in 1993 =	\$25,000	(in millions)
Normalized Return on Assets =	12%	
Normalized Return on Assets (pre-tax) =	20%	
<i>Normalized Income statement (based upon 12% ROA)</i>		
Earnings Before Interest and Taxes =	5000	
Interest Expenses =	1400	

Earnings Before Taxes =	3600
Taxes (at 40%) =	1440
Net Income =	2160
- (Cap Ex - Deprec'n) * (1-Debt ratio) =	500
FCFE	1660

$$\text{Cost of Equity} = 7\% + 1.1 * 5.5\% = 13.05\%$$

$$\text{Expected Growth Rate} = 5\%$$

Earnings before interest and taxes is calculated using the ROA:

$$\text{ROA} = \text{EBIT} (1 - \text{tax rate}) / \text{Total Assets} = 12\% \text{ (given in the problem)}$$

$$\text{Value of Equity} = (1660 * 1.05) / (.1305 - .05) = \$21,652$$

$$\text{B. Value of Equity} = \$21,652 / 1.1305^2 = \$16,942$$

Problem 3

A.

Earnings Before Interest and Taxes =	\$52.70
- Interest Expense =	\$17.00
Earnings Before Taxes =	\$35.70
- Taxes (40%)	\$14.28
Earnings After Taxes =	\$21.42
- (Cap Ex - Deprec'n) * (1-Debt Ratio) =	\$3.75
- Δ Working Capital * (1- Debt Ratio) =	\$4.76
FCFE =	\$12.91

$$\text{EBIT} = \text{Interest Expense} * \text{Interest Coverage Rate} = \$17 * 3.10 = \$ 52.70$$

The change in working capital is based upon revenues growing at 4%.

$$\text{B. Cost of Equity} = 7\% + 1.1 * 5.5\% = 13.05\%$$

$$\text{Expected Growth Rate} = 4\%$$

$$\text{Value of Equity} = 12.91 * 1.04 / (.1305 - .04) = \$148.36 \text{ million}$$

Problem 4

A.

<i>Year</i>	<i>Net Income (in millions)</i>
1987	\$0.30
1988	\$11.50
1989	(\$2.40)

1990	\$7.20
1991	(\$4.60)
1992	(\$1.90)
Average =	\$1.68

Net Income =	\$1.68
- (Cap Ex - Deprec'n) * (1 - Debt ratio) =	1.30
= FCFE =	\$0.38

B. Cost of Equity (until 1996) = 7% + 1.2 * 5.5% = 13.6%

Cost of Equity (after 1996) = 7% + 5.5% = 12.5%

<i>Year</i>	<i>Net Income</i>	<i>(Cap. Ex - Deprec'n)</i>	<i>FCFE</i>	<i>Terminal Value</i>
				*
				(1 - Debt Ratio)
1993	\$1.78	\$1.37	\$0.42	
1994	\$1.89	\$1.43	\$0.45	
1995	\$2.00	\$1.50	\$0.50	
1996	\$2.12	\$1.58	\$0.54	\$11.20
Term Year	\$2.23	\$1.70	\$0.63	

Terminal Value = \$0.63 / (.125 - .05) = \$8.40 million

Value of Equity

$$= 0.42/1.136 + 0.45/1.136^2 + 0.50/1.136^3 + (0.54 + 8.40)/1.136^4$$

= \$6.43 million

Value per Share = \$ 6.43 million / 0.5 = \$12.86

Problem 5

A.

	<i>Equity</i>	<i>Debt</i>
Market Value Weight	61.61%	38.39%
Cost of Component	13.33%	5.10%
Cost of Capital =	13.33% (0.6161) + 5.1% (0.3839) = 10.17%	

B.

<i>Year</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>Terminal Year</i>
EBIT (1-t)	\$8.25	\$9.08	\$9.98	\$10.98	\$11.42
- (Cap Ex - Deprec'n)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

- Δ Working Capital	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
= FCFF	\$8.25	\$9.08	\$9.98	\$10.98	\$11.42

Terminal Value \$185.18

Terminal Value = $\$11.42 / (.1017 - .04) = \185.18

Present Value = $\$8.25 / 1.1017 + \$9.08 / 1.1017^2 + \$9.98 / 1.1017^3 + (\$10.98 + \$185.18) / 1.1017^4 = \155.60 million

C. Value of Equity = Value of Firm - Market Value of Debt = $\$155.60 - \$109 = \$46.60$ million

Value of Equity Per Share = $\$46.60 / 15.9 = \2.93

Problem 6

a. Normalized net income next year = $.10 * 1000 = \$100$ million

Net Cap Ex (1- debt ratio) = $80 (1.05)(1-.25) = \$63$ million

Change in working capital = $[1575(.095) - 1500(.10)] (1-.25) = \0 million

FCFE = $\$37$ million

c. To value the firm, we first have to re-estimate the free cashflows to equity with normalized working capital – the change computed above cannot be sustained in perpetuity since it reflects a change in working capital as a percent of revenues

Normalized net income next year = $.10 * 1000 = \$100$ million

Net Cap Ex (1- debt ratio) = $80 (1.05)(1-.25) = \$63$ million

Change in working capital = $[1575(.095) - 1500(.095)](1-.25) = \5.34 million

FCFE = $\$31.66$ million

Value of Equity = $31.66 / (.09 - .05) = \$791.50$ million

Problem 7

A,

	<i>Current</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Terminal year</i>
Revenues	\$5,000.00	\$5,500.00	\$6,050.00	\$6,655.00	\$7,320.50	\$8,052.55	\$8,455.18
EBITDA	\$300.00	\$484.00	\$701.80	\$958.32	\$1,259.13	\$1,610.51	\$1,691.04
Depreciation	\$800.00	\$800.00	\$800.00	\$800.00	\$800.00	\$800.00	\$840.00
EBIT	-\$500.00	-\$316.00	-\$98.20	\$158.32	\$459.13	\$810.51	\$851.04
- t* EBIT	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$125.50	\$340.41
EBIT (1-t)	-\$500.00	-\$316.00	-\$98.20	\$158.32	\$459.13	\$685.01	\$510.62

+ Depreciation		\$800.00	\$800.00	\$800.00	\$800.00	\$800.00	\$840.00
- Cap Ex		\$600.00	\$600.00	\$600.00	\$600.00	\$600.00	\$1,095.31
FCFF		-\$116.00	\$101.80	\$358.32	\$659.13	\$885.01	\$255.31
Terminal value						\$6,382.77	
PV		-\$106.42	\$85.68	\$276.69	\$466.94	\$4,723.55	
Value of firm	\$5,446.45						
EBITDA Margin	6.00%	8.80%	11.60%	14.40%	17.20%	20.00%	20.00%
NOL	700	1016	1114.2	955.88	496.754	0	

- c. If there was a 20% chance of bankruptcy, the value of the firm today can be written as follows:

DCF Value (1- Probability of distress) + Distress sale value (probability of distress)

$$= 5446.45 (1-.20) + .6*1250 * .20 = \$4,507 \text{ million}$$