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 VALUING FINANCIAL SERVICE FIRMS
 

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**Problem 1**

a. Return on equity =  $4/40 = 10\%$

Expected growth rate = ROE \* Retention ratio =  $10\% * (1 - .6) = 4\%$

Value per share =  $2.40 (1.04) / (.096 - .04) = \$44.57$

b. Value =  $2.40 (1+g) / (.096 - g) = 40$

Solving for g,

Implied growth rate =  $3.40\%$

**Problem 2**

a. Return on equity =  $2.00/14 = 14.29\%$

Expected growth rate = ROE \* Retention ratio =  $14.29\% (1 - .20/2.00) = 12.86\%$

b. Value per share

Payout ratio in year 6 =  $1 - g / \text{ROE} = 1 - 5/12 = 58.33\%$

Cost of equity in high growth =  $6\% + 1.10(4\%) = 10.40\%$

Cost of equity in stable growth =  $10\%$

Year	EPS	DPS	Terminal price	PV
1	\$2.26	\$0.23		\$0.20
2	\$2.55	\$0.25		\$0.21
3	\$2.87	\$0.29		\$0.21
4	\$3.24	\$0.32		\$0.22
5	\$3.66	\$0.37	\$44.86	\$27.57
6	\$3.84	\$2.24		
				\$28.42

Terminal value =  $2.24 / (.10 - .05) = \$44.86$

Value per share (discounted at 10.40%) =  $\$26.39$

**Problem 3**

a. Price to Book ratio =  $1.40 = (\text{ROE} - .04) / (.11 - .04)$

Solving for ROE, ROE =  $13.8\%$

b. If ROE = Cost of equity, the price to book ratio will become one.

**Problem 4**

- a. I would expect Sun Trust to trade at a lower price to book ratio, because it has a lower return on equity than the average for the sector.

<i>Company Name</i>	<i>P/BV</i>	<i>ROE</i>
Wachovia Corp.	2.05	18.47%
PNC Financial Serv.	2.54	21.56%
SunTrust Banks	1.91	15.35%
State Street Corp.	6.63	19.52%
Mellon Financial Corp.	4.59	23.95%
Morgan (J.P.) & Co	1.74	19.39%
First Union Corp.	1.52	19.66%
FleetBoston Fin'l	2.25	20.15%
Bank of New York	7.01	25.36%
Chase Manhattan Corp.	2.6	24.60%
Wells Fargo	3.07	17.72%
Bank of America	1.69	19.31%
Bank of Montreal	1.23	18.08%
<b>Average</b>	<b>2.99</b>	<b>20.24%</b>

- b. Regressing price to book ratios against return on equity

$$PBV = -4.08 + 34.91 ROE$$

<i>Company Name</i>	<i>P/BV</i>	<i>ROE</i>	<i>Predicted PBV</i>
Wachovia Corp.	2.05	18.47%	2.37
PNC Financial Serv.	2.54	21.56%	3.45
SunTrust Banks	1.91	15.35%	1.28
State Street Corp.	6.63	19.52%	2.74
Mellon Financial Corp.	4.59	23.95%	4.28
Morgan (J.P.) & Co	1.74	19.39%	2.69
First Union Corp.	1.52	19.66%	2.78
FleetBoston Fin'l	2.25	20.15%	2.96
Bank of New York	7.01	25.36%	4.77
Chase Manhattan Corp.	2.6	24.60%	4.51
Wells Fargo	3.07	17.72%	2.11
Bank of America	1.69	19.31%	2.66
Bank of Montreal	1.23	18.08%	2.23

**Problem 5**

- a. Value of the loan portfolio = 75 million (PVA, 6 years, 6.5%) + 1000/1.065<sup>6</sup>=  
\$1.048 million

b. Value of equity = Value of loan – Value of debt = 1048 – 800 = \$ 248 million

### Problem 6

a. Return on equity = 20%

Cost of equity = 5.2% + 1.2 (4%) = 10%

Excess equity returns this year = (.20 - .10) (100) = \$ 10 million

Expected growth rate = ROE \* Retention ratio = .20 \* .7 = 14%

<i>Year</i>	<i>Excess equity return</i>	<i>PV at 10%</i>	<i>BV of Equity at beginning of year</i>
1	\$11.40	\$10.36	\$114.00
2	\$13.00	\$10.74	\$129.96
3	\$14.82	\$11.13	\$148.15
4	\$16.89	\$11.54	\$168.90
5	\$19.25	\$11.96	\$192.54
6	\$21.95	\$12.39	\$219.50
7	\$25.02	\$12.84	\$250.23
8	\$28.53	\$13.31	\$285.26
9	\$32.52	\$13.79	\$325.19
10	\$37.07	\$14.29	\$370.72

BV of Equity at beginning of year = BV of Equity (1+ growth rate)

c. Value of equity = Book value of equity + PV of excess equity return  
 = 100 + 122.35 = 222.35 million

c. If the return on equity after year 10 is 15%:

Excess equity return in year 11 = (.15 - .10) (BV of equity end of year 10)  
 = (.15 - .10) (370.72\*1.14) = \$21.13 million

Assuming no growth in excess equity returns over time

Terminal value of excess equity return = 21.13/ .10 = \$211.30 million

PV of terminal value = 211.30 / 1.10<sup>10</sup> = \$81.46 million

This value will increase if you assume a perpetual growth rate.