

Valuing Banks: North Fork Bank & Trust¹
In-Class Problem²

Valuing Banks

Preparatory to an equity offering, Earl Consulting, has been retained to assess the potential market value of North Fork Bank and Trust (NFB&T) for a private equity group interested in purchasing a major portion of the bank's stock. The private group is comprised of NFB&T key executives, board members, and major depositors and borrowers who, as a group, have expressed a required return of 10% for the bank to be an attractive investment for them. As Earl's senior banking analyst you've been called in to provide a valuation assessment based on NFB&T's income statement, balance sheet, and portfolio data. You've been informed that the bank has a risk rating compared to other similar banks of 1.29, that current short term Treasury rates are 2%, and that equity capital of similar banks is expected to earn 7%.

1. Complete the Key Ratios analysis based on the attached table of historical values for NFB&T

Key Ratios (%)	2010	2011	2012	2013	2014
Loan Growth	3.00%	3.25%	3.20%	3.30%	3.50%
Loan Interest Rate	7.00%	7.00%	7.00%	6.50%	6.50%
Deposit Growth	3.00%	1.09%	0.99%	3.19%	3.38%
Deposit Interest Rate	5.00%	4.805%	4.70%	4.50%	4.30%
Cost/Income	50.91%	53.25%	52.19%	47.10%	45.14%
Tax Rate	30.00%	30.00%	30.00%	30.00%	30.00%
Equity/Total Assets	4.00%	6.00%	8.00%	8.00%	8.00%
Return on Equity ²	18.90%	19.54%	14.37%	10.92%	12.19%

¹ Book value per end of year

² Return on beginning of year equity

Ratios calculated from values

Values calculated from ratios

¹ This primer is intended to present an abbreviated discussion of the included economic concepts and is not intended to be a full or complete representation of them or the underlying economic foundations from which they are built.

² This In-Class Problem was developed by Richard Haskell, Ph.D., Assistant Professor, Finance, Gore School of Business, Westminster College, Salt Lake City, Utah (2014).

2. Complete the Balance Sheet, Income Statement, and Cash Flow Statement values based on the following Key Ratios analysis for NFB&T.

	2015	2016	2017	2018	2019	2020
Balance Sheet Data¹						
Loans	1,226.20	1,281.38	1,332.64	1,379.28	1,427.55	1,477.52
Total Assets	1,226.20	1,281.38	1,332.64	1,379.28	1,427.55	1,477.52
Deposits	1,128.08	1,178.84	1,225.99	1,268.90	1,313.32	1,359.28
Equity	98.13	102.54	106.64	110.38	114.24	118.24
Total Liabilities	1,226.20	1,281.38	1,332.64	1,379.28	1,427.55	1,477.52
Income Statement Data						
Interest Income	71.58	74.80	78.16	81.29	84.14	87.08
Interest Expense	(42.10)	(44.00)	(45.97)	(47.81)	(49.49)	(51.22)
Net Interest Income	29.48	30.80	32.19	33.48	34.65	35.86
Operating Expenses	(13.26)	(13.25)	(13.84)	(14.40)	(14.90)	(15.42)
Operating Profits	16.21	17.56	18.35	19.08	19.75	20.44
Income Taxes	(4.86)	(5.27)	(5.50)	(5.72)	(5.92)	(6.13)
Net Income	11.35	12.29	12.84	13.36	13.82	14.31
Cash Flow Statement						
Net Income	11.35	12.29	12.84	13.36	13.82	14.31
Equity (Increase) Decrease	(4.23)	(4.42)	(4.10)	(3.73)	(3.86)	(4.00)
OCI	-	-	-	-	-	-
Cash Flow to Equity (CFE)	7.12	7.87	8.74	9.62	9.96	10.31
Key Ratios (%)						
Loan Growth	4.50%	4.50%	4.00%	3.50%	3.50%	3.50%
Loan Interest Rate	6.10%	6.10%	6.10%	6.10%	6.10%	6.10%
Deposit Growth	4.50%	4.50%	4.00%	3.50%	3.50%	3.50%
Deposit Interest Rate	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%
Cost/Income	45.00%	43.00%	43.00%	43.00%	43.00%	43.00%
Tax Rate	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Equity/Total Assets	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Return on Equity ²	12.09%	12.53%	12.53%	12.53%	12.53%	12.53%

¹ Book value per end of year

Ratios calculated from values

² Return on beginning of year equity

Values calculated from ratios

3. Calculate the preferred discount rate to be used in a DCF/KVD model for NFB&T.

Use CAPM structure to identify k_e

$$k_e = R_F + (R_M - R_F)\beta$$

$$k_e = .02 + (.07 - .02) \times 1.29 = .0845$$

4. Provide a DCF/KVD valuation for NFB&T representing the bank's expectations based on the values determined in 1-3 above.

CFE	PV _{CFE}	Total
7.12	6.57	6.57
7.87	6.70	13.26
8.74	6.85	20.12
9.62	6.96	27.08
9.96	6.64	33.72

PV_{DCF}	\$33.72
CV_{KVD}	208.29
PV_{CV}	128.02
Value	161.74

5. Provide a DCF/KVD valuation for NFB&T representing the private equity's expectations based on the values determined in 1-3 above.

CFE	PV _{CFE}	Total	PV _{CFE}	Total
7.12	6.57	6.57	6.48	6.48
7.87	6.70	13.26	6.51	12.98
8.74	6.85	20.12	6.57	19.55
9.62	6.96	27.08	6.57	26.13
9.96	6.64	33.72	6.19	32.31

PV_{DCF}	\$32.31
CV_{KVD}	158.62
PV_{CV}	89.54
Value	121.85

6. Given what you know about how these two valuations are formed and their representative perspectives, upon what valuation would you recommend your client make an equity offer?

In this case, the bank's valuation seems relatively clear (161.74), and given the equity capitalization requirements of modern banking, we might surmise the bank has limited room to negotiate. Equally clear is the client's requirement of a valuation based on a 10% return (121.85). However, the negotiations between the client and bank may not be unreasonable in light of the client's already close relationship with the bank, placing the bank in a potentially difficult position were a transaction to be unsuccessful (major depositors and borrowers could take business elsewhere, etc.).

For a transaction to occur, the bank may need to make a case to your client that there are interest income and expense, and cost efficiencies available to the bank under the client's ownership that may not exist under the current ownership, thus improving operating cash flows (CFE) with your clients as owners (best owner concepts) and potentially allowing for a higher offering price. Similarly, your client may need to press the bank on the potential disadvantages of not reaching an agreed upon value, such that the bank may be able to soften its expectations.

If the client and bank hold to their assigned valuations, there will be no transaction, which is an altogether common outcome in the corporate finance.

Instructional Notes

- Loan and deposit growth is calculated as $\frac{\text{balance}_t - \text{balance}_{t-1}}{\text{balance}_{t-1}}$
- Loan and Deposit interest is calculated as $\frac{\text{Interest}_t}{\text{balance}_{t-1}}$
- Return on Equity (ROE) is calculated as $\frac{\text{NI}_t}{\text{Equity}_{t-1}}$
- Cost/Income ratio is calculated as $\frac{\text{Operating Expenses}}{\text{Net Interest Income}}$
- $\text{PV}_{\text{DCF}} = \sum \frac{\text{CFE}}{(1+k_e)^t}$
- $\text{CV}_{\text{KVD}} = \frac{\text{CFE} \left(1 - \frac{g}{\text{ROE}}\right)}{k_e - g}$
- g represents growth rate of loan portfolio

	2010	2011	2012	2013	2014
Balance Sheet Data¹					
Loans	1,030.00	1,063.50	1,097.50	1,133.70	1,173.40
Total Assets	1,030.00	1,063.50	1,097.50	1,133.70	1,173.40
Deposits	988.80	999.70	1,009.70	1,043.00	1,079.50
Equity	41.20	63.80	87.80	90.70	93.90
Total Liabilities	1,030.00	1,063.50	1,097.50	1,133.70	1,173.40
Income Statement Data					
Interest Income	70.00	72.10	74.40	71.30	73.70
Interest Expense	(48.00)	(47.50)	(47.00)	(45.40)	(44.90)
Net Interest Income	22.00	24.60	27.40	25.90	28.80
Operating Expenses	(11.20)	(13.10)	(14.30)	(12.20)	(13.00)
Operating Profits Before Taxes	10.80	11.50	13.10	13.70	15.80
Income Taxes	(3.24)	(3.45)	(3.93)	(4.11)	(4.74)
Net Income	7.56	8.05	9.17	9.59	11.06
Cash Flow Statement					
Net Income	7.56	8.05	9.17	9.59	11.06
(Increase) Decrease in Equity	-1.2	(22.60)	(24.00)	(2.90)	(3.20)
Other Comprehensive income (loss)	0.20	-	-	-	-
Cash Flow to Equity (CFE)	6.56	(14.55)	(14.83)	6.69	7.86
Key Ratios (%)					
Loan Growth	3.00%				
Loan Interest Rate	7.00%				
Deposit Growth	3.00%				
Deposit Interest Rate	5.00%				
Cost/Income	50.91%				
Tax Rate	30.00%	30.00%	30.00%	30.00%	30.00%
Equity/Total Assets					
Return on Equity ²	18.90%				

¹ Book value per end of year

² Return on beginning of year equity

