

Bank & Financial Institution Modeling: – Certification Quiz Questions

Module 3 – Bank Valuation

1. You are valuing a regional, U.S.-based bank. The set of comparable public companies, the screening criteria, and the valuation multiples are shown below:

Comparable Companies - U.S.-Based Regional Banks with Between \$20 Billion and \$150 Billion in Total Assets

(\$ in Millions USD Except Per Share Data)

Operating Statistics:	Capitalization & Assets			P / E Year 1	P / TBV LTM	ROATCE		ROA LTM	ROE LTM
	Equity Value	Tangible Book Value	Total Assets			LTM	Year 1		
M&T Bank Corporation	\$ 15,079.8	\$ 6,957.0	\$122,787.9	14.7 x	2.2 x	13.0%	14.2%	1.16%	8.9%
Comerica, Inc.	7,843.7	6,973.0	71,012.0	14.1 x	1.1 x	7.8%	7.8%	0.76%	7.2%
Zions Bancorporation	6,002.3	5,601.3	58,410.9	15.0 x	1.1 x	6.1%	7.1%	0.69%	5.3%
BOK Financial Corporation	4,499.3	2,946.7	30,600.0	13.9 x	1.5 x	10.3%	10.6%	0.96%	8.8%
Cullen/Frost Bankers, Inc.	4,342.3	2,096.2	28,341.4	14.6 x	2.1 x	14.3%	13.9%	1.09%	10.6%
Associated Banc-Corp	2,971.2	1,846.6	27,467.2	14.9 x	1.6 x	10.6%	10.4%	0.71%	6.6%
First Horizon National Corporation	3,395.9	2,017.7	25,387.3	15.3 x	1.7 x	13.7%	10.8%	1.01%	11.4%
Webster Bank, N.A.	3,526.8	1,700.5	24,069.8	16.0 x	2.1 x	11.9%	12.5%	0.88%	8.7%
Maximum:	15,079.8	6,973.0	122,787.9	16.0 x	2.2 x	14.3%	14.2%	1.16%	11.4%
75th Percentile:	6,462.7	5,940.2	61,561.2	15.1 x	2.1 x	13.2%	12.9%	1.03%	9.3%
Median:	\$ 4,420.8	\$ 2,521.5	\$ 29,470.7	14.8 x	1.6 x	11.3%	10.7%	0.92%	8.8%
25th Percentile:	3,494.1	1,974.9	26,947.2	14.5 x	1.4 x	9.7%	9.8%	0.75%	7.1%
Minimum:	2,971.2	1,700.5	24,069.8	13.9 x	1.1 x	6.1%	7.1%	0.69%	5.3%

First Niagara Financial Group, Inc.	\$ 3,203.1	\$ 2,401.0	\$ 39,413.0	15.6 x	1.3 x	9.8%	7.7%	0.63%	5.9%
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Operating Statistics:	Net		Fee Income %	Net Charge-Offs / Avg. Loans	Reserves / Non-Perf. Loans	TCE / Tangible Assets	Common Equity Tier 1 %	Tier 1 Leverage Ratio
	Interest Margin %	Efficiency Ratio						
M&T Bank Corporation	3.16%	56.9%	39.0%	0.24%	100.6%	7.5%	9.8%	10.2%
Comerica, Inc.	2.56%	66.7%	38.5%	0.15%	158.5%	9.9%	10.6%	10.3%
Zions Bancorporation	3.14%	70.6%	23.0%	0.31%	111.0%	9.8%	12.2%	11.6%
BOK Financial Corporation	2.59%	65.9%	47.4%	0.04%	230.7%	9.8%	12.8%	9.6%
Cullen/Frost Bankers, Inc.	3.47%	56.6%	30.9%	0.11%	199.0%	7.6%	11.6%	7.9%
Associated Banc-Corp	2.83%	66.9%	31.1%	0.17%	114.0%	7.0%	9.4%	7.5%
First Horizon National Corporation	2.87%	72.4%	43.4%	0.28%	45.3%	8.0%	10.8%	10.0%
Webster Bank, N.A.	3.07%	59.7%	26.8%	0.21%	49.3%	7.2%	10.8%	8.4%
Maximum:	3.47%	72.4%	47.4%	0.31%	230.7%	9.9%	12.8%	11.6%
75th Percentile:	3.15%	67.8%	40.1%	0.25%	168.6%	9.8%	11.8%	10.2%
Median:	2.97%	66.3%	34.8%	0.19%	112.5%	7.8%	10.8%	9.8%
25th Percentile:	2.77%	59.0%	29.9%	0.14%	87.8%	7.4%	10.4%	8.3%
Minimum:	2.56%	56.6%	23.0%	0.04%	45.3%	7.0%	9.4%	7.5%

First Niagara Financial Group, Inc.	3.11%	67.8%	21.6%	0.33%	113.3%	6.3%	8.5%	7.6%
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Which of the following statements represents a potential PROBLEM with the selection criteria for these companies?

- a. The screen is too narrow – given the Total Assets of these companies, you should expand the set to include money-center banks as well.
- b. In addition to Total Assets, you should add profitability criteria, such as a required ROE, ROA, or Net Income.
- c. In addition to Total Assets, you should also screen by P / E or P / TBV multiples to get more consistent figures.
- d. \$20 billion to \$150 billion in Total Assets may be too wide a range, so you may want to narrow it.

2. Based on the screenshot above, which of the following conclusions might you draw about First Niagara's current market valuation?

- a. First Niagara is almost certainly overvalued based on its P / E multiple, but may not be overvalued based on its P / TBV multiple.
- b. First Niagara is operating a riskier business than many of these other banks, but it is not achieving superior financial results.
- c. If we were advising First Niagara, we might recommend that the company raise additional Equity soon.
- d. First Niagara is more of a pure-play commercial bank than many of its comparable public companies.
- e. All of the above.

3. You have selected a set of comparable public companies, but several companies in the set have very different CET 1 Ratios. As a result, you want to adjust each company in the set for Excess or Deficit Capital based on a Targeted CET 1 Ratio of 12%.

One bank's Equity Value is \$2,000, its Tangible Book Value is \$1,000, its CET 1 is \$1,100, and its Net Income to Common is \$100. This bank also has Risk-Weighted Assets of \$8,000.

What would this bank's P / E and P / TBV multiples be AFTER you adjust for Excess Capital? Assume a 40% tax rate and 2% rate of return on the Excess Capital.

- a. Adjusted P / TBV = 2.2x; Adjusted P / E = 18.9x.
 - b. Adjusted P / TBV = 2.3x; Adjusted P / E = 20.3x.
 - c. Adjusted P / TBV = 1.9x; Adjusted P / E = 21.0x.
 - d. Adjusted P / TBV = 2.2x; Adjusted P / E = 18.8x.
 - e. Adjusted P / TBV = 2.3x; Adjusted P / E = 20.2x.
- 4. You are now selecting a set of Precedent Transactions for this same valuation. Which of the following statements describes one of the PRIMARY differences vs. Public Comps when selecting and interpreting Precedent Transactions for a bank?**
- a. Often, you use stricter screening criteria for the Precedent Transactions to prevent irrelevant deals from entering the set.
 - b. You tend to focus on P / E multiples rather than P / BV or P / TBV multiples to get more consistent output.
 - c. You're less likely to adjust for Excess or Deficit Capital because the acquired banks in a set of Precedent Transactions may differ from each other significantly.
 - d. You're more likely to use a broader geographic screen, such as acquired North American banks rather than acquired U.S.-based banks.
 - e. Due to the lack of data, you can include minority-stake deals, majority-stake deals, and 100% acquisitions together in any set of Precedent Transactions.

5. You are valuing a U.K.-based bank, and have set up a multi-stage Dividend Discount Model over 15 projected years, as shown in the screenshots below:

Dividend Discount Model (DDM) - Key Assumptions:

Model Assumptions:	
Initial Cost of Equity:	12.00%
Annual Reduction in Cost of Equity:	0.10%
PV of Future Stock Issuances:	125.1
Estimated # of Future Shares to Be Issued:	38.2
Total Shares Outstanding:	288.2
Stub Period Fraction:	0.285

Final Year Total Asset Growth Rate:	
Base	7.0%
Upside	8.0%
Downside	6.0%
Selected:	7.0%

Final Year ROTCE:	
Base	12.0%
Upside	14.0%
Downside	11.0%
Selected:	12.0%

Terminal Value - Perpetuity Growth Rate Method:	
Terminal P / TBV Multiple by ROTCE:	1.25 x
Terminal Value:	1,762.8
(+) PV of Terminal Value:	397.0
(+) Excess / (-) Deficit Capital:	-
(+) Sum of PV of Dividends:	289.0
Implied Equity Value:	685.9
<i>% of Implied Value from PV of TV:</i>	<i>57.9%</i>
Implied Share Price:	£ 2.38
Bank's Current Share Price:	3.27

Terminal Value - Multiples Method:	
Baseline Terminal P / TBV Multiple:	1.25 x
Terminal Value:	1,762.8
(+) PV of Terminal Value:	397.0
(+) Excess / (-) Deficit Capital:	-
(+) Sum of PV of Dividends:	289.0
Implied Equity Value:	685.9
<i>% of Implied Value from PV of TV:</i>	<i>57.9%</i>
Implied Share Price:	£ 2.38
Bank's Current Share Price:	3.27

Premium / (Discount) to Current: (27.3%)

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Dividend Discount Model:	Units:	Historical		Projected															
		Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20		
Model Phases:			Phase 1 - Dividend Issuances Begin and Grow Rapidly:				Phase 2 - Slowing Dividend Growth:						Phase 3 - Stabilization:						
Net Income to Common:	£M	£ 34.5	£ 54.2	£ 66.1	£ 83.1	£ 99.1	£ 113.4	£ 115.4	£ 117.6	£ 122.3	£ 126.2	£ 130.0	£ 134.4	£ 138.9	£ 143.0	£ 153.0	£ 163.7		
% Growth:	%	N/A	57.2%	21.8%	25.8%	19.2%	14.5%	1.8%	1.9%	3.9%	3.2%	3.0%	3.3%	3.4%	3.0%	7.0%	7.0%		
Full-Year Dividends:	£M	-	-	6.6	24.9	34.7	45.4	49.1	52.9	58.1	63.1	59.6	52.5	50.8	54.6	58.5	62.6		
% Growth:	%	N/A	N/A	N/A	277.3%	39.1%	30.8%	8.1%	7.9%	9.7%	8.6%	(5.6%)	(11.9%)	(3.1%)	7.5%	7.0%	7.0%		
Targeted Payout Ratio:	%							42.5%	45.0%	47.5%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		
Actual Payout Ratio:	%			10.0%	30.0%	35.0%	40.0%	42.5%	45.0%	47.5%	50.0%	45.8%	39.0%	36.6%	38.2%	38.2%	38.2%		
Dividends For Remaining Period in Year:	£M		-	6.6	24.9	34.7	45.4	49.1	52.9	58.1	63.1	59.6	52.5	50.8	54.6	58.5	62.6		
Beginning Common Shareholders' Equity:	£M		218.7	364.9	461.4	556.6	658.0	763.1	829.5	894.2	958.4	1,021.4	1,091.9	1,173.8	1,261.8	1,350.2	1,444.7		
(+) Net Income to Common:	£M		54.2	66.1	83.1	99.1	113.4	115.4	117.6	122.3	126.2	130.0	134.4	138.9	143.0	153.0	163.7		
(+) Stock Issuances:	£M		92.0	37.0	37.0	37.0	37.0	-	-	-	-	-	-	-	-	-	-		
(-) Common Dividends:	£M		-	(6.6)	(24.9)	(34.7)	(45.4)	(49.1)	(52.9)	(58.1)	(63.1)	(59.6)	(52.5)	(50.8)	(54.6)	(58.5)	(62.6)		
Ending Common Shareholders' Equity:	£M	218.7	364.9	461.4	556.6	658.0	763.1	829.5	894.2	958.4	1,021.4	1,091.9	1,173.8	1,261.8	1,350.2	1,444.7	1,545.8		
(-) Goodwill & Other Intangibles:	£M	(49.5)	(53.0)	(57.2)	(62.3)	(68.2)	(74.8)	(75.0)	(80.2)	(85.8)	(91.3)	(95.8)	(103.0)	(110.7)	(118.4)	(126.7)	(135.6)		
Common Equity Tier 1 (CET 1):	£M	169.2	311.9	404.2	494.3	589.8	688.3	754.5	813.9	872.5	930.1	996.1	1,070.8	1,151.2	1,231.7	1,318.0	1,410.2		
Targeted Common Equity Tier 1 (CET1) Ratio:	%		13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%		
Actual Common Equity Tier 1 (CET 1) Ratio:	%	11.6%	16.7%	16.8%	15.6%	15.8%	15.9%	15.8%	15.0%	14.2%	13.5%	13.0%	13.0%	13.0%	13.0%	13.0%	13.0%		
Total Assets:	£M	2,754.0	3,333.5	3,949.0	4,815.2	5,467.6	6,141.7	6,817.3	7,499.0	8,173.9	8,868.7	9,578.2	10,296.5	11,068.8	11,843.6	12,672.6	13,559.7		
% Growth:	%	65.1%	21.0%	18.5%	21.9%	13.5%	12.3%	11.0%	10.0%	9.0%	8.5%	8.0%	7.5%	7.5%	7.0%	7.0%	7.0%		
Risk-Weighted Assets (RWA):	£M	1,461.0	1,863.0	2,399.4	3,161.1	3,725.0	4,330.6	4,772.1	5,436.8	6,130.4	6,873.2	7,662.5	8,237.2	8,855.0	9,474.9	10,138.1	10,847.8		
RWA % Total Assets:	%	53.1%	55.9%	60.8%	65.6%	68.1%	70.5%	70.0%	72.5%	75.0%	77.5%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%		
% Growth:	%	77.7%	27.5%	28.8%	31.7%	17.8%	16.3%	10.2%	13.9%	12.8%	12.1%	11.5%	7.5%	7.5%	7.0%	7.0%	7.0%		
Goodwill & Other Intangibles % Total Assets:	%	1.80%	1.59%	1.45%	1.29%	1.25%	1.22%	1.10%	1.07%	1.05%	1.03%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%		
Return on Tangible Common Equity:	%	24.4%	22.6%	18.5%	18.5%	18.3%	17.7%	16.0%	15.0%	14.5%	14.0%	13.5%	13.0%	12.5%	12.0%	12.0%	12.0%		
Discount Period (With Stub Period):	Year Frac.		0.28	1.28	2.28	3.28	4.28	5.28	6.28	7.28	8.28	9.28	10.28	11.28	12.28	13.28	14.28		
Mid-Year Discount Period:	Year Frac.		0.14	0.78	1.78	2.78	3.78	4.78	5.78	6.78	7.78	8.78	9.78	10.78	11.78	12.78	13.78		
PV of Dividends:	£M		-	6.0	20.4	25.3	29.5	28.5	27.6	27.1	26.3	22.3	17.6	15.4	14.8	14.3	13.8		
Cost of Equity:	%		12.00%	12.00%	12.00%	12.00%	12.00%	11.90%	11.80%	11.70%	11.60%	11.50%	11.40%	11.30%	11.20%	11.10%	11.00%		
Cumulative Discount Factor:	#		1.02	1.09	1.22	1.37	1.54	1.72	1.92	2.15	2.39	2.67	2.97	3.31	3.68	4.09	4.54		
PV of Future Stock Issuances:	£M		9.8	33.9	30.2	27.0	24.1	-	-	-	-	-	-	-	-	-	-		

The Total Asset Growth Rate and ROTCE in each projected year also differ based on the scenario (Base, Upside, or Downside). Which of the following statements describes a potential PROBLEM with this model?

- Excess / (Deficit) Capital appears to be hard-coded to 0 in the Implied Equity Value calculations, which is inconsistent with the company's Targeted CET 1 Ratio.
- The Final Year ROTCE and Asset Growth Rates may not be far enough apart in the different cases (data from comparable companies would be helpful).
- By Year 20, metrics such as the Dividend Payout Ratio, ROTCE, and Net Income Growth have not yet stabilized sufficiently.
- You should never include Stock Issuances in a DDM.
- Since the company is not currently issuing Dividends, a multi-stage DDM is inappropriate because it's too speculative.

6. Which of the following represents a **CORRECT** statement about Stock Issuances, Stock Repurchases, and Stock-Based Compensation in the type of Dividend Discount Model shown above?

Statement #1: One valid approach is to set all these items to 0 in the projected years so that you do not have to adjust the company's share count at all.

Statement #2: Stock Issuances and Stock-Based Compensation tend to increase a bank's Implied Equity Value because they increase its Tangible Book Value, while Stock Repurchases have the opposite effect.

Statement #3: If you do include these items, you must adjust the bank's current share count by adding (Present Value of Future Shares Issued – Present Value of Future Shares Repurchased) / Bank's Current Share Price.

Statement #4: These items only impact a public bank's valuation because you only calculate implied per-share values for public companies, not private ones.

- a. All four of these statements are correct.
 - b. Only #1, #2, and #3 are correct.
 - c. Only #1 and #3 are correct.
 - d. Only #2, #3, and #4 are correct.
 - e. Only #1, #3, and #4 are correct.
 - f. Only #2 and #4 are correct.
7. In this same Dividend Discount Model, you calculated the Present Value of Terminal Value with Terminal Value / ((1 + Final Year Cost of Equity) ^ Discount Period with Stub Period Included). For example, $\$1,762.8 / ((1 + 11\%) ^ 14.28) = \397 .

This formula produces an answer that is roughly correct, but it's not **exactly** right. What's the problem with this calculation?

- a. Since the Discount Rate changes over time, you should use a Cumulative Discount Factor instead, and divide the Terminal Value by that Factor.
 - b. You can't use the Cumulative Discount Factor shown in this model because it includes the Mid-Year Convention; you should use a Factor that reflects the Stub Period in Year 6 but NOT the Mid-Year Convention.
 - c. You don't necessarily have to ignore the Mid-Year Convention when calculating the PV of Terminal Value, but if you do, then you must ensure that the Terminal Value represents the company's PV from the *end* of Year 20 onward.
 - d. All of the above.
- 8. Your co-worker reviews your Dividend Discount Model and says that it would be much easier to set up for a private bank since you don't need to value private banks on a per-share basis. Is this co-worker correct?**
- a. Not necessarily – you do need to value private banks on a per-share basis if Stock Issuances/Repurchases or Stock-Based Compensation change the share count in the projected period.
 - b. Yes – private companies do not issue or repurchase stock or issue Stock-Based Compensation, so some of the complexity goes away.
 - c. Not necessarily – the items above could still affect a private company's share count, but you're more likely to set them to 0 in the projected years when valuing a private bank.
 - d. Only if the private bank has no plans to go public in the future, as an IPO would change its share count.
- 9. You need to calculate the Cost of Equity for a regional bank. However, the bank's comparable public companies have all gone public within the past 1-2 years, and there is not enough data to calculate Levered Beta for each one.**

Normally, you would calculate this bank's Cost of Equity with Risk-Free Rate + Equity Risk Premium * Median Levered Beta from the Public Comps. What is the MOST reasonable alternative calculation in this case?

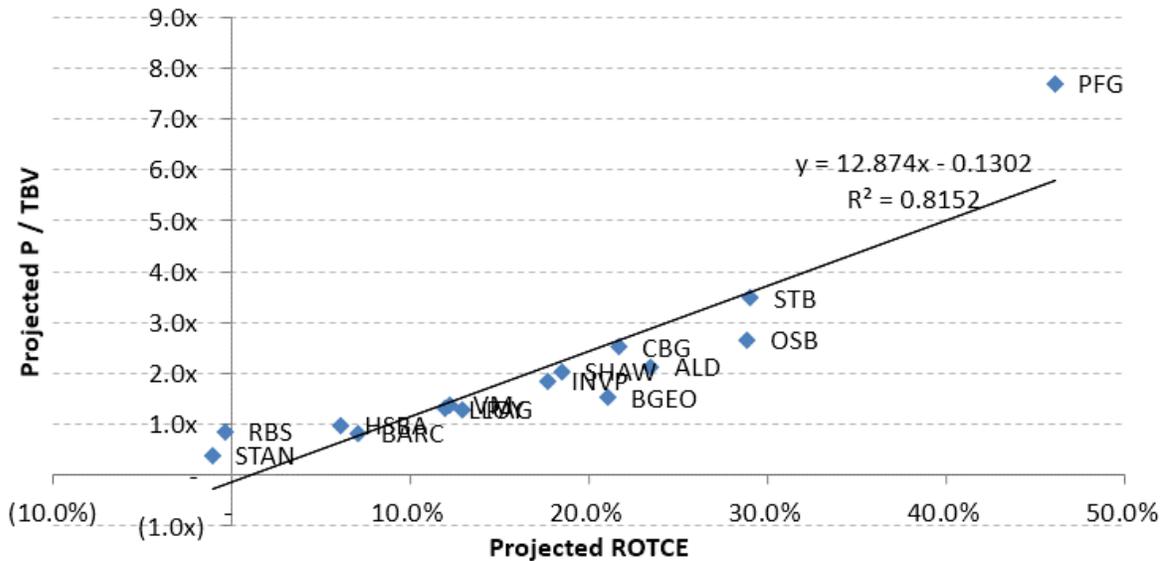
- a. The premise of the question is incorrect because you must un-lever and re-lever Beta from the Public Comps to account for capital structure differences.
- b. Expand the set of Public Comps to include older and more established banks, or calculate Cost of Equity based on Dividend Yield + Dividend Growth Rate instead.
- c. Calculate the Return on Equity for each Public Comp, and use the median figure for this bank's Cost of Equity.
- d. Calculate the median annualized return to equity investors (including share price appreciation and Dividends) for this set of Public Comps, and use that for the company's cost of Equity.

10. For which of the following banks would a Residual Income (Excess Returns) Model make the MOST sense as a supplemental analysis to the traditional Dividend Discount Model?

- a. A mid-sized regional bank in a developed country that has maintained a 50% Dividend Payout Ratio for the past decade.
- b. A mid-sized regional bank that has significant Excess Capital (e.g., 15% CET 1 vs. 10% for the peer companies) with no plans to increase Dividends or repurchase stock.
- c. A small, high-growth bank that is not currently issuing Dividends but which has an extremely high ROE (e.g., 2-3x its Cost of Equity).
- d. A diversified money-center bank that is expected to grow its Loan portfolio in-line with GDP growth and keep issuing Dividends at a steady Payout Ratio in the future.

11. Since ROTCE and P / TBV tend to be closely correlated for commercial banks, you have created a Regression Analysis based on both metrics for a set of 15 U.K.-based banks. The screenshot below shows the analysis:

Regression Valuation Analysis - United Kingdom-Based Banks



Which of the following conclusions can you draw from this Regression?

- a. This analysis is not valid because a set of 15 banks is too large to be useful; you should narrow the set based on Total Assets, Net Income, or other financial criteria.
- b. There's a fairly strong correlation, but the predictive function for P / TBV is not likely to be helpful since you're using projected figures rather than historical ones.
- c. The fact that there's at least one outlier – PFG – reduces the usefulness of the analysis; you should remove this outlier to get a stronger correlation.
- d. This Regression won't be especially useful for valuation purposes unless the company's Implied P / TBV is dramatically far off from its current multiple.

12. Which of the following statements BEST describe(s) how Excess or Deficit Capital would affect all the valuation methodologies for a commercial bank?

Statement #1: You may have to adjust the Public Comps by increasing or reducing each company's Equity Value, Book Value, Tangible Book Value, and Net Income.

Statement #2: You're less likely to adjust the Precedent Transactions and Regression Analysis because the banks in these sets may target very different capital levels.

Statement #3: You need to adjust the subject company's Current Book Value, Dividends, and ROE in both the Dividend Discount Model and Residual Income Model.

- a. All three of these statements are correct.
- b. Only statements #1 and #2 are correct.
- c. Only statements #2 and #3 are correct.
- d. Only statements #1 and #3 are correct.
- e. Only statement #1 is correct.
- f. Only statement #2 is correct.
- g. Only statement #3 is correct.