

# ***Bank & Financial Institution Modeling***

## ***– Certification Quiz Questions***

### **Module 1 – Bank Overview: Accounting, Valuation, and Regulations**

- 1. Why is Enterprise Value NOT a meaningful metric for commercial banks?**
  - a. Commercial banks generate a significant portion of their revenue from Net Interest Income.
  - b. Banks have such high Cash balances that the traditional Enterprise Value calculation often results in negative values.
  - c. It's impossible to separate a bank's Assets and Liabilities into operational vs. financial line items.
  - d. Regulatory capital requirements make it impossible to calculate Enterprise Value the normal way.
  - e. Enterprise Value-based metrics such as EBITDA and EBIT are useless for a bank since you cannot separate Interest from core business profitability.
  
- 2. The following two questions are based on the screenshot shown below. Please review this bank's simplified Balance Sheet and make the required calculations:**

Commercial Bank - Balance Sheet:				
ASSETS:	Beginning:		Interest Rate:	Risk Weight:
Cash:	\$ 150.0		0.0%	0.0%
Available for Sale Securities:	250.0		3.0%	100.0%
Other Securities:	175.0		2.0%	100.0%
<b>Gross Loans:</b>	<b>1,500.0</b>		<b>8.0%</b>	<b>90.0%</b>
Allowance for Loan Losses:	(15.0)			
<b>Net Loans:</b>	<b>1,485.0</b>			
Goodwill & Other Intangible Assets:	110.0		0.0%	0.0%
Other Assets:	100.0		4.0%	100.0%
<b>Total Assets:</b>	<b>\$ 2,270.0</b>			
LIABILITIES & EQUITY:	Beginning:		Interest Rate:	
<b>Liabilities:</b>				
Deposits:	\$ 1,500.0		2.0%	
Senior Debt:	250.0		4.0%	
Subordinated Notes:	50.0		8.0%	
Other Borrowings:	100.0		5.0%	
Convertible Bonds:	50.0		0.0%	
<b>Total Liabilities:</b>	<b>1,950.0</b>			
<b>Equity:</b>				
Common Stockholders' Equity:	300.0			
Preferred Stock:	20.0		10.0%	
<b>Total Equity:</b>	<b>320.0</b>			
<b>Total Liabilities &amp; Equity:</b>	<b>\$ 2,270.0</b>			

What is the correct value for Net Interest Income \*at the top of the company's Income Statement\*? Use the Beginning balances for the calculations.

- a. \$84.0 million.
- b. \$86.0 million.
- c. \$74.0 million.
- d. \$72.0 million.

3. In the same screenshot shown above, what are the correct values for the bank's Common Equity Tier 1 (CET 1), Tier 1 Capital, and Tier 2 Capital? Assume that 50% of the bank's Allowance for Loan Losses qualifies for inclusion in Tier 2 Capital.
- a. CET 1 = \$210.0 million; Tier 1 = \$210.0 million; Tier 2 = \$107.5 million.
  - b. CET 1 = \$190.0 million; Tier 1 = \$210.0 million; Tier 2 = \$57.5 million.
  - c. CET 1 = \$190.0 million; Tier 1 = \$210.0 million; Tier 2 = \$115.0 million.
  - d. CET 1 = \$190.0 million; Tier 1 = \$210.0 million; Tier 2 = \$107.5 million.
4. A bank's CET 1 Ratio is 10.0%, its Liquidity Coverage Ratio (LCR) is 105.0%, and its Net Stable Funding Ratio (NSFR) is 95.0%. What's the BEST way for this bank to solve this problem?
- a. Raise additional Equity via a follow-on offering; such a deal would boost all three ratios.
  - b. Issue 10-year Subordinated Notes and keep the proceeds in Cash; this would boost the LCR and NSFR.
  - c. Divest Loans and Deposits simultaneously; this would boost all three ratios.
  - d. Solicit additional Deposits from customers and keep the proceeds in Cash; this would boost the NSFR and might increase the LCR slightly.
5. Why is it so important to calculate regulatory capital ratios based on Risk-Weighted Assets (RWA) in addition to ratios based on Tangible Assets (TA)?
- a. Metrics based on RWA may be misleading since companies could assign unrealistic risk weights to "game the system," but metrics based on TA may not tell the whole story because they ignore risk and off-Balance Sheet Assets.

- b. RWA-based metrics are more closely linked to Net Interest Income, while TA-based metrics are linked to Net Income at the bottom of the Income Statement.
- c. A bank's Book Value and Tangible Book Value follow TA-based metrics more closely, but its Net Income follows RWA-based metrics more closely.
- d. All of the above.

**6. Consider the screenshot below, which shows a bank's Beginning and Ending Loan Loss Reserve:**

Loan Loss Reserve Calculations:	
Annual Period:	
Beginning Reserve Balance:	\$ 15.0
<b>Net Charge-Offs Calculation:</b>	
(-) Gross Charge-Offs:	(7.0)
(+) Recoveries:	4.0
<b>Net Charge-Offs:</b>	<b>(3.0)</b>
(+) Additions to Provisions:	8.0
Ending Reserve Balance:	\$ 20.0

**In this same period, the bank also issues \$103.0 in new Gross Loans. Which of the following statements is TRUE regarding the bank's presentation of these results on its financial statements?**

- a. The Net Charge-Offs appear on the Income Statement as an expense in the current period.
- b. The Gross Loans balance on the Balance Sheet increases by \$103.0 since it reflects the previous balance plus all Loan issuances in this period.
- c. The Net Loans balance on the Balance Sheet increases by \$95.0 since it reflects the Loan issuances, Net Charge-Offs, and Additions to Provisions.
- d. Both the Net Charge-Offs and Additions to Provisions appear as explicit non-cash add-backs on the Cash Flow Statement.

- e. The “Additions to Provisions” line item is embedded within Net Charge-Offs on the Income Statement, but it’s a non-cash add-back on the Cash Flow Statement.

**7. A regional, pure-play commercial bank has met very conservative targets for its CET 1 Ratio, Tier 1 Capital Ratio, and Total Capital Ratio. They are over 12%, 15%, and 20%, respectively, and the company’s Leverage Ratio is close to 10% as well.**

**There’s a sudden financial crisis, and the bank announces that it is about to go bankrupt and needs a bailout from the federal government. What is the MOST LIKELY explanation for what went wrong?**

- a. The company had to record a massive, unexpected charge-off, which wiped out all its regulatory capital.
  - b. The company had a huge amount of Off-Balance Sheet Assets that “blew up,” resulting in unsustainable losses.
  - c. The company’s asset management division placed too many speculative bets for clients, which were not counted on its Balance Sheet, and many of its positions lost all their value overnight.
  - d. The company’s Liquidity Coverage Ratio (LCR) was too low, so it did not have enough Cash and other liquid Assets to cover extremely high Deposit withdrawals over a 30-day period.
- 8. You’re valuing a commercial bank, and it has a Return on Tangible Common Equity (ROTCE) of 10% with a P / TBV multiple of 1.5x. The median ROTCE for this bank’s peer companies is between 9% and 11%, and the median P / TBV multiple is between 2.0x and 2.5x. Why can you NOT necessarily conclude that this bank is undervalued?**
- a. The bank you’re valuing might have a significantly lower CET 1 Ratio than its comparable public companies.
  - b. The bank you’re valuing might have a different business model than the peer companies (e.g., it might be more or less dependent on Net Interest Income).

- c. The bank you're valuing might have a much lower Dividend Payout Ratio than the comparable public companies.
- d. All of the above.

## 9. Consider the simplified Dividend Discount Model shown in the screenshot below:

**Simplified Dividend Discount Model - I&B Bank**  
(USD \$ in Millions Except Per Share and Per Unit Data)

### Simplified DDM Assumptions:

Targeted CET 1 Ratio:	8.0%	<b>Terminal Value Calculation:</b>	
Total Asset Growth:	4.0%	Baseline Terminal P / TBV Multiple:	1.03 x
RWA % Total Assets:	75.0%	Baseline Terminal Value:	153
Return on Assets (NI to Common):	0.55%	(+) PV of Terminal Value:	84
Cost of Equity:	9.0%	(+) PV of Dividends:	35
Stock Issuances:	-	<b>Implied Equity Value:</b>	<b>\$ 119</b>
Stock Repurchases:	-	Bank's Current Equity Value:	\$ 150
		<b>Premium / (Discount) to Implied Value</b>	<b>26.3%</b>

Dividend Projections:	Historical			Projected						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Net Income to Common:</b>	\$ 9	\$ 9	\$ 8	\$ 10	\$ 10	\$ 11	\$ 12	\$ 12	\$ 13	\$ 13
% Growth:		(3.1%)	(9.3%)	22.8%	4.6%	6.3%	5.8%	4.0%	4.0%	4.0%
<b>Dividends:</b>	5	5	5	6	7	7	8	7	7	7
% Growth:		0.0%	0.0%	24.1%	6.3%	7.9%	14.9%	(16.9%)	4.0%	4.0%
Payout Ratio:	54.8%	56.5%	62.4%	63.0%	64.0%	65.0%	70.5%	56.4%	56.4%	56.4%
Beginning Common Shareholders' Equity:	N/A	160	166	171	178	184	191	194	200	205
(+) Net Income to Common:	9	9	8	10	10	11	12	12	13	13
(-) Common Stock Dividends:	(5)	(5)	(5)	(6)	(7)	(7)	(8)	(7)	(7)	(7)
(+) Stock Issuances:	3	4	3	4	5	5	-	-	-	-
(-) Stock Repurchases:	(1)	(2)	(1)	(1)	(2)	(2)	-	-	-	-
<b>Ending Common Shareholders' Equity:</b>	<b>160</b>	<b>166</b>	<b>171</b>	<b>178</b>	<b>184</b>	<b>191</b>	<b>194</b>	<b>200</b>	<b>205</b>	<b>211</b>
(-) Goodwill:	(50)	(49)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)
(-) Other Intangible Assets:	(20)	(19)	(18)	(17)	(16)	(15)	(15)	(15)	(15)	(15)
<b>Common Equity Tier 1 (CET 1):</b>	<b>90</b>	<b>98</b>	<b>105</b>	<b>113</b>	<b>120</b>	<b>128</b>	<b>131</b>	<b>137</b>	<b>142</b>	<b>148</b>
Total Assets:	1,685	1,774	1,850	1,936	2,023	2,107	2,191	2,279	2,370	2,465
Growth Rate:		5.3%	4.2%	4.6%	4.5%	4.1%	4.0%	4.0%	4.0%	4.0%
Risk-Weighted Assets:	1,200	1,300	1,375	1,438	1,516	1,593	1,643	1,709	1,777	1,848
RWA % Total Assets:	71.2%	73.3%	74.3%	74.3%	75.0%	75.6%	75.0%	75.0%	75.0%	75.0%
CET 1 Ratio:	7.5%	7.5%	7.6%	7.8%	7.9%	8.0%	8.0%	8.0%	8.0%	8.0%
Return on Tangible Common Equity:	N/A	9.8%	8.2%	9.4%	9.2%	9.1%	9.0%	9.2%	9.2%	9.2%
Return on Assets (NI to Common):	N/A	0.52%	0.45%	0.53%	0.53%	0.54%	0.55%	0.55%	0.55%	0.55%
Discount Period:			0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
PV of Dividends:				\$ 6	\$ 6	\$ 5	\$ 6	\$ 4	\$ 4	\$ 4

In this model, we have calculated the Terminal P / TBV Multiple with  $(\text{ROTCE} - \text{Net Income to Common Growth}) / (\text{Cost of Equity} - \text{Net Income to Common Growth})$  in the final projected year.

Which of the following represents the BIGGEST flaw or oversight in this model that we should correct?

- a. We are not factoring in the impact of Stock Issuances and Stock Repurchases on the bank's share count.
- b. The calculation for the Terminal P / TBV Multiple is not correct because the bank's growth rates, returns-based metrics, and Dividend Payout Ratio have not stabilized sufficiently by Year 10.
- c. We are not using the mid-year convention to discount each Dividend issuance to its Present Value, so the "PV of Dividends" line item is highly distorted.
- d. Around 70% of the bank's Implied Equity Value comes from the PV of the Terminal Value; this percentage should be significantly lower, so we need to re-think the assumptions.

**10. You're reviewing the Federal Reserve's "stress test" results for U.S. banks under the Dodd-Frank legislation. One regional bank performed well on the Comprehensive Capital Analysis and Review (CCAR) test but did \*not\* pass the Dodd-Frank Act Stress Testing (DFAST) test. What might this result mean?**

- a. Only the bank's issuances of Stock-Based Compensation keep it above the minimum 5% CET 1 Ratio.
- b. The bank may be planning to reduce Dividends or issue more Stock as part of its business plan.
- c. The bank may be planning to repurchase significantly more Stock as part of its business plan.
- d. All of the above.