###### Solutions for End-of-Chapter Questions and Problems: Chapter Twenty

1. Identify and briefly discuss the importance of the five functions of an FI’s capital?

Capital serves as a primary cushion against operating losses and unexpected losses in the value of assets (such as the default of a loan). FIs need to hold enough capital to provide confidence to uninsured creditors that they can withstand reasonable shocks to the value of their assets. In addition, the FDIC, which guarantees deposits, is concerned that sufficient capital is held so that their funds are protected, because they are responsible for paying insured depositors in the event of a failure. This protection of the FDIC funds includes the protection of the FI owners against increases in insurance premiums. Finally, capital also serves as a source of financing to purchase and invest in assets.

2. Why are regulators concerned with the levels of capital held by an FI compared with those held by a nonfinancial institution?

Regulators are concerned with the levels of capital held by an FI because of its special role in society. A failure of an FI can have severe repercussions to the local and/or national economy unlike non-financial institutions. Such externalities impose a burden on regulators to ensure that these failures do not impose major negative externalities on the economy. Higher capital levels will reduce the probability of such failures.

**The most severe capital crisis since the Great Depression occurred in 2008-2009 during the financial crisis.** The U.S. was in the middle of an epic financial panic, complete with a classic run on key parts of the financial system. The Congress passed and the President signed the Emergency Economic Stabilization Act. The act created the $700 billion Troubled Assets Relief Program (TARP). Part of TARP was the Capital Purchase Program to encourage U.S. financial institutions to build capital to increase the flow of financing to U.S. businesses and consumers and to support the U.S. economy. Under the program, the Treasury purchased over $200 billion. The senior preferred shares qualify as Tier 1 capital and rank senior to common stock. Financial institutions had to meet certain standards, including: (1) ensuring that incentive compensation for senior executives does not encourage unnecessary and excessive risks that threaten the value of the financial institution; (2) required payback of any bonus or incentive compensation paid to a senior executive based on statements of earnings, gains or other criteria that are later proven to be materially inaccurate; (3) prohibition on the financial institution from making any golden parachute payment to a senior executive based on the Internal Revenue Code provision; and (4) agreement not to deduct for tax purposes executive compensation in excess of $500,000 for each senior executive. In addition to capital injections received as part of the Capital Purchase Program TARP provided additional emergency funding to Citigroup ($25 billion) and Bank of America ($20 billion).

3. What is the difference between the economic definition of capital and the book value definition of capital?

The book value definition of capital is the value of assets minus liabilities as found on the balance sheet. This amount often is referred to as accounting net worth. The economic definition of capital is the difference between the market value of assets and the market value of liabilities.

a. How does economic value accounting recognize the adverse effects of credit risk?

The loss in value caused by credit risk is borne first by the equity holders, and then by the liability holders. With market value accounting, the adjustments to equity value are made simultaneously as the losses due to this risk element occur. Thus, economic insolvency may be revealed before accounting value insolvency occurs.

b. How does book value accounting recognize the adverse effects of credit risk?

Because book value accounting recognizes the value of assets and liabilities at the time they were placed on the books or incurred by the firm, losses are not recognized until the assets are sold or regulatory requirements force the firm to make balance sheet accounting adjustments. In the case of credit risk, these adjustments usually occur after all attempts to collect or restructure the loans have occurred.

4. Why is the market value of equity a better measure of an FI's ability to absorb losses than book value of equity?

The market value of equity is more relevant than book value because in the event of a bankruptcy, the liquidation (market) values determine the FI's ability to pay various claimants.

5. State Bank has the following year-end balance sheet (in millions):

**Assets Liabilities and Equity**

Cash $10 Deposits $90

Loans 90 Equity 10

Total assets $100 Total liabilities and equity $100

The loans primarily are fixed-rate, medium-term loans, while the deposits are either short-term or variable-rate deposits. Rising interest rates have caused the failure of a key industrial company, and as a result, 3 percent of the loans are considered uncollectable and thus have no economic value. One-third of these uncollectable loans will be charged off. Further, the increase in interest rates has caused a 5 percent decrease in the market value of the remaining loans. What is the impact on the balance sheet after the necessary adjustments are made according to book value accounting? According to market value accounting?

Under book value accounting, the only adjustment is to charge off $1 million (0.03 x 1/3) percent of the loans. Thus, the loan portfolio will decrease by $0.90million ($90m x 0.03 x 1/3) and a corresponding adjustment will occur in the equity account. The new book value of equity will be $9.10 million. We assume no tax affects.

Under market value accounting, the 3 percent decrease in loan value will be recognized, as will the 5 percent decrease in market value of the remaining loans. Thus, equity will decrease by 0.03 x $90m + 0.05 x $90m(1 – 0.03) = $7.065 million. The new market value of equity will be $2.935 million.

6. What are the arguments for and against the use of market value accounting for DIs?

Market values produce a more accurate picture of the FI’s current financial position for both stockholders and regulators. Stockholders can more easily see the effects of changes in interest rates on the FI’s equity, and they can evaluate more clearly the liquidation value of a distressed FI. Among the arguments against market value accounting are that market values sometimes are difficult to estimate, particularly for small FIs with non-traded assets. This argument is countered by the increasing use of asset securitization as a means to determine value of even thinly traded assets. In addition, some argue that market value accounting can produce higher volatility in the earnings of FIs. A significant issue in this regard is that regulators may close an FI too quickly under the prompt corrective action requirements of FDICIA. The third argument against market value accounting is that FIs are less willing to accept longer-term asset exposures, such as mortgage loans and C&I loans, if these assets have to be continuously marked to market to reflect changing credit quality and interest rates. The concern is that market value accounting may interfere with FIs’ special functions as lenders and monitors and may even result in (or accentuate) a major credit crunch.

7. What is the significance of prompt corrective action as specified by the FDICIA legislation?

Since December 18, 1992, under the FDICIA legislation, regulators must take specific actions−prompt corrective action (PCA)−when a DI falls outside the zone 1, or well capitalized, category. Table 20-5 summarizes these regulatory actions. Importantly, the prompt corrective action provision requires regulators to appoint a receiver for the DI when the leverage ratio falls below 2 percent. Thus, even though the DI is not technically insolvent in terms of book value of equity, the institution can be placed into receivership. The idea behind the mandatory and discretionary set of actions to be taken by regulators for each of the five capital adequacy zones is to enforce minimum capital requirements and limit the ability of regulators to show forbearance to the worst capitalized DIs.

8. What is the Basel Agreement?

The Basel Agreement identifies risk-based capital ratios agreed upon by the member countries of the Bank for International Settlements. The ratios are to be implemented for all DIs under their jurisdiction. Further, most countries in the world now have accepted the guidelines of this agreement for measuring capital adequacy.

9. What are the major features of the Basel III capital requirements?

The goal of Basel III is to raise the quality, consistency, and transparency of the capital base of banks and to strengthen the risk coverage of the capital framework. Specifically, Pillar I of Basel III calls for enhancements to both the Standardized Approach, discussed below, and IRB Approach to calculating adequate capital. Changes to Pillar 1 include a greater focus on common equity, the inclusion of new capital conservation and countercyclical buffers to the minimum level of capital, significantly higher capital requirements for trading and derivatives activities, and a substantial strengthening of counterparty credit risk calculations in determining required minimum capital. Pillar 2 calls for enhanced bank-wide governance and risk management to be put in place, such as enhanced incentives for banks to better manage risk and returns over the long term, more stress testing, and implementation of sound compensation practices. Pillar 3 calls for the enhanced disclosure of risks, such as those relating to securitization exposures and sponsorship of off-balance-sheet vehicles.

Basel III is applicable to all U.S. national banks, state member and nonmember banks, state and federal savings associations, all U.S. bank holding companies except those with less than $500 million in total consolidated assets (although the rules apply to the subsidiary banks of these small holding companies), and all U.S. savings association holding companies. Advanced (IRB) approaches may be used by institutions with consolidated assets of $250 billion or more, or with consolidated on-balance-sheet foreign exposures of $10 billion or more (approximately 20 of the largest U.S. banking organizations). All other depository institutions use the Standardized Approach for calculating capital adequacy. Under Basel III, depository institutions must calculate and monitor four capital ratios: common equity Tier I (CET1) risk-based capital ratio, Tier I risk-based capital ratio, total risk-based capital ratio, and Tier I leverage ratio.

10. What are the definitional differences between CET1, Tier I and Tier II capital?

CET1 is primary or core capital of the DI. CET1capital is closely linked to a DI’s book value of equity, reflecting the concept of the core capital contribution of a DI’s owners. CET1 capital consists of the equity funds available to absorb losses. Basically, it includes the book value of common equity plus minority equity interests held by the DI in subsidiaries minus goodwill. Goodwill is an accounting item that reflects the amount a DI pays above market value when it purchases or acquires other DIs or subsidiaries.

Tier I capital is the primary capital of the DI plus additional capital elements. Tier I capital is the sum of CET1 capital and additional Tier I capital. Included in additional Tier I capital are other options available to absorb losses of the bank beyond common equity. These consist of instruments with no maturity dates or incentives to redeem, e.g., noncumulative perpetual preferred stock. These instruments may be callable by the issuer after 5 years only if they are replaced with “better” capital.

Tier II capital is supplementary capital. Tier II capital is a broad array of secondary “equity like” capital resources. It includes a DI’s loan loss reserves assets plus various convertible and subordinated debt instruments with maximum caps.

11. Under Basel III, what four capital ratios must DIs calculate and monitor?

Under Basel III, depository institutions must calculate and monitor four capital ratios: common equity Tier I (CET1) risk-based capital ratio, Tier I risk-based capital ratio, total risk-based capital ratio, and Tier I leverage ratio.

i) **Common equity Tier I risk-based capital ratio** = Common equity Tier I capital/credit risk-adjusted assets

ii) **Tier I risk-based capital ratio** = Tier I capital (Common equity Tier I capital + additional Tier I capital)/credit risk-adjusted assets

iii) **Total risk-based capital ratio** = Total capital (Tier I + Tier II)/credit risk-adjusted assets,

and iv) **Tier I leverage ratio** = tier I capital / total exposure.

12. What are the credit risk-adjusted assets in the denominator of the common equity Tier I (CET1) risk-based capital ratio, the Tier I risk-based capital ratio, and the total risk-based capital ratio?

Under Basel III capital adequacy rules, risk-adjusted assets represent the denominator of the risk-based capital ratios. Two components make up credit risk-adjusted assets: (1) credit risk-adjusted on-balance-sheet assets, and (2) credit risk-adjusted off-balance-sheet assets.

13. How is the leverage ratio for an FI defined?

Under the Standardized Approach, the Basel III leverage ratio is defined as the ratio of Tier 1 capital to on-balance-sheet assets. Under the Advanced Approach, Basel III leverage ratio is defined as the ratio of Tier I core capital divided by the book value of total exposure. Total exposure is equal to the DI’s total assets plus off-balance-sheet exposure. For derivative securities, off-balance-sheet exposure is current exposure plus potential exposure as described above. For off-balance-sheet credit (loan) commitments a conversion factor of 100 percent is applied unless the commitments are immediately cancelable. In this case, a conversion factor of 10 percent is used. Once Basel III is fully phased in, to be to be adequately capitalized, a DI must hold a minimum leverage ratio of 4.5 percent.

14. Identify the five zones of capital adequacy and explain the mandatory regulatory actions corresponding to each zone.

Zone 1: Well capitalized. The CET1 risk-based capital (RBC) ratio exceeds 6.5 percent, Tier I RBC ratio exceeds 8 percent, total RBC ratio exceeds 10 percent, and leverage ratio exceeds 5 percent. No regulatory action is required.

Zone 2: Adequately capitalized. The CET1 RBC ratio exceeds 4.5 percent, Tier I RBC ratio exceeds 6 percent, total RBC ratio exceeds 8 percent, and leverage ratio exceeds 4 percent. Institutions may not use brokered deposits except with the permission of the FDIC.

Zone 3: Undercapitalized. The CET1 RBC ratio is less than 4.5 percent, Tier I RBC ratio is less than 6 percent, total RBC ratio is less than 8 percent, and leverage ratio is less than 4 percent. Requires a capital restoration plan, restricts asset growth, requires approval for acquisitions, branching, and new activities, disallows the use of brokered deposits, and suspends dividends and management fees.

Zone 4: Significantly undercapitalized. The CET1 RBC ratio is less than 3 percent, Tier I RBC ratio is less than 4 percent, total RBC ratio is less than 6 percent, and leverage ratio is less than 3 percent. Same as zone 3 plus recapitalization is mandatory, places restrictions on deposit interest rates, interaffiliate transactions, and the pay level of officers.

Zone 5: Critically undercapitalized. Tangible equity to total assets is less than or equal to 2 percent. Places the bank in receivership within 90 days, suspends payment on subordinated debt, and restricts other activities at the discretion of the regulator.

The mandatory provisions for each of the zones described above include the penalties for any of the zones prior to the specific zone.

15. Explain the process of calculating credit risk-adjusted on-balance-sheet assets.

Balance sheet assets are assigned to one of several categories of credit risk exposure. The dollar amount of assets in each category is multiplied by an appropriate weight, e.g., 0 percent, 20 percent, 50 percent, 100 percent, or 150 percent. The weighted dollar amounts of each category are added together to get the total credit risk-adjusted on-balance-sheet assets.

16. Under Basel III, how are residential 1-4 family mortgages assigned to a credit risk class?

Residential 1-4 family mortgages would be separated into two risk categories (“category 1 residential mortgage exposures” and “category 2 residential mortgage exposures”). Category 1 residential mortgages include traditional, first-lien, prudently underwritten mortgage loans. Category 2 residential mortgages include junior liens and non-traditional mortgage products. The risk weight assigned to the residential mortgage exposure then depends on the mortgage’s loan-to-value ratio. For example, category 1 mortgages with a loan-to-value ratio of less than 60 percent have a risk weight of 35 percent; category 2 mortgages with a loan-to-value ratio of greater than 90 percent have a risk weight of 200 percent. Mortgages over 90 days past due are assigned a risk weight of 150 percent.

17. Under Basel III, how are risk weights for sovereign exposures are determined?

Risk weights for sovereign exposures are determined using OECD Country Risk Classifications (CRCs). A sovereign is a central government (including the U.S. government) or an agency, department, ministry, or central bank of a central government. The OECD’s CRCs assess a country’s credit risk using two basic components: the country risk assessment model (CRAM)− an econometric model that produces a quantitative assessment of country credit risk−and the qualitative assessment of the CRAM results−which integrates political risk and other risk factors not fully captured by the CRAM. The two components are combined and classified into one of eight risk categories (0-7). Countries assigned to categories 0-1 have the lowest possible risk assessment and are assigned a risk weight of 0 percent, while countries assigned to category 7 having the highest possible risk assessment and are assigned a risk weight of 150 percent. The OECD provides CRCs for more than 150 countries. Assessments are publicly available on the OECD website. Countries with no CRC assessments are assigned a credit risk weight of 100 percent. A 150 percent risk weight is assigned to sovereign exposures immediately upon determining that an event of sovereign default has occurred or if a sovereign default has occurred during the previous five years.

18. National Bank has the following balance sheet (in millions) and has no off-balance-sheet activities.

**Assets Liabilities and Equity**

Cash $20 Deposits $960

Treasury bills 40 Subordinated debentures 25

Residential mortgages Common stock 45

(category 1; loan-to-value Retained earnings 40

ratio = 70%) 600 Total liabilities and equity $1,090

Business loans 430

Total assets $1,090

a. What is the CET1 risk-based ratio?

The CET1 risk-based ratio is ($45 + $40)/$1,090 = 0.07798 or 7.798 percent.

b. What is the Tier I risk-based capital ratio?

Risk-adjusted assets = $20x0.0 + $40x0.0 + $600x0.5 + $430x1.0 = $730.

Tier I capital ratio = ($45 + $40)/$730 = 0.11644 or 11.644 percent.

c. What is the total risk-based capital ratio?

The total risk-based capital ratio = ($45 + $40 + $25)/$730 = 0.15068 or 15.068 percent.

d. What is the leverage ratio?

The leverage ratio is ($45 + $40)/$1,090 = 0.07798 or 7.798 percent.

e. In what capital risk category would the bank be placed?

The bank would be place in the well-capitalized category.

19. What is the capital conservation buffer? How would this buffer affect your answers to question 18?

Basel III introduced a capital conservation buffer designed to ensure that DIs build up a capital surplus, or buffer, outside periods of financial stress which can be drawn down as losses are incurred during periods of financial stress. The buffer requirements provide incentives for DIs to build up a capital surplus (e.g., by reducing discretionary distributions of earnings (reduced dividends, share buy-backs and staff bonuses)) to reduce the risk that their capital levels would fall below the minimum requirements during periods of stress. The capital conservation buffer must be composed of CET1 capital and are held separately from the minimum risk-based capital requirements. Under Basel III, a DI would need to hold a capital conservation buffer of greater than 2.5 percent of total risk-weighted assets to avoid being subject to limitations on capital distributions and discretionary bonus payments to executive officers.

To have no limitations on the bank’s payout ratio, the CET1 ratio must be > 7%, the Tier I ratio must be > 8.5%, and the total capital ratio must be > 10.5%. In problem 18, all three of these conditions are met. So, the bank has no limitations on its payout ratio.

20. What is the countercylical capital buffer? If the home country set a countercyclical capital buffer of 1.5 percent, how would this buffer affect your answers to question 18?

Basel III also introduced a countercyclical capital buffer which may be declared by any country which is experiencing excess aggregate credit growth. The countercyclical buffer can vary between 0 percent and 2.5 percent of risk-weighted assets. This buffer must be met with CET1 capital and DIs are given 12 months to adjust to the buffer level. Like the capital conservation buffer, if a DI’s capital levels fall below the set countercyclical capital buffer, restrictions on earnings payouts are applied. The countercyclical capital buffer aims to protect the banking system and reduce systemic exposures to economic downturns. Losses can be particularly large when a downturn is preceded by a period of excess credit growth. The accumulation of a capital buffer during an expansionary phase would increase the ability of the banking system to remain healthy during periods of declining asset prices and losses from weakening credit conditions. By assessing a countercyclical buffer when credit markets are overheated, accumulated capital buffers can absorb any abnormal losses that a DI might experience when the credit cycle turns. Consequently, even after these losses are realized, DIs would remain healthy and able to access funding, meet obligations, and continue to serve as credit intermediaries.

In problem 18, the bank’s CET1 is 7.798%, the Tier I ratio is 11.644%, and the total capital ratio must be > 15.068%. In problem 18, these ratios mean the bank can pay out only 40 percent of its earnings.

21. Onshore Bank has $20 million in assets, with risk-adjusted assets of $10 million. CET1 capital is $500,000, additional Tier I capital is $50,000 and Tier II capital is $400,000. How will each of the following transactions affect the value of the Tier I and total capital ratios? What will the new value of each ratio be?

The current value of the CET1 ratio is 5 percent ($500,000/$10m), of the Tier I ratio is 5.5 percent (($500,000 + $50,000)/$10m), and the total ratio is 9.5 percent (($500,000 + $50,000 + $400,000)/$10m).

a. The bank repurchases $100,000 of common stock with cash.

CET1 capital decreases to $400,000, Tier I capital decreases to $450,000 and total capital decreases to $850,000. Cash has a 0 risk weight so risk-weighted assets do not change. Thus, the CET1 ratio decreases to 4 percent, the Tier I ratio decreases to 4.5 percent and the total capital ratio decreases to 8.5 percent.

b. The bank issues $2 million of CDs and uses the proceeds to issue category 1 mortgage loans with a loan-to-value ratio of 80 percent.

The risk weight for category 1 mortgages with a loan-to-value ratio of 80 percent is 50 percent. Thus, risk-weighted assets increase to $10 million + $2 million (0.5) = $11 million. The CET1 ratio decreases to $500,000/$11 million = 4.54 percent, the Tier I ratio decreases to $550,000/$11 million = 5 percent and the total capital ratio decreases to $950,000/$11 million = 8.64 percent.

c. The bank receives $500,000 in deposits and invests them in T-bills.

T-bills have a 0 risk weight so risk-weighted assets remain unchanged. Thus, all three ratios remain unchanged.

d. The bank issues $800,000 in common stock and lends it to help finance a new shopping mall.

CET1 equity increases to $1.3 million, Tier I equity increases to $1.35 million, and total capital increases to $1.75 million. The business loan’s risk weight is 100 percent. Thus, risk-weighted assets increase to $10 million + $800,000 (1) = $10.8 million. The CET1 ratio, increases to $1.3m/$10.8m = 12.03 percent, the Tier I ratio increases to $1.35m/$10.8m = 12.50 percent, and the total capital ratio increases to 16.20 percent.

e. The bank issues $1 million in nonqualifying perpetual preferred stock and purchases general obligation municipal bonds.

CET1 and Tier I capital are unchanged. Total capital increases to $1.95 million. General obligation municipal bonds fall into the 20 percent risk category. So, risk-weighted assets increase to $10 million + $1 million (0.2) = $10.2 million. Thus, the CET1 ratio decreases to $500,000/$10.2 million = 4.90 percent, the Tier I ratio decreases to $550,000/$10.2 million = 5.39 percent, and the total capital ratio increases to 19.12 percent.

f. Homeowners pay back $4 million of category 1 mortgages with loan-to-value ratios of 40 percent and the bank uses the proceeds to build new ATMs.

The category 1 mortgage loans with loan-to-value ratios of 40 percent have a risk weight of 35 percent. The ATMs are 100 percent risk weighted. Thus, risk-weighted assets increase to $10 million - $4 million (0.35) + $2 million (1.0) = $10.6 million. The CET1 capital ratio decreases to $500,000/$10.6m = 4.72 percent, the Tier I capital ratio decreases to $550,000/$10.6m = 5.19 percent, and the total capital ratio decreases to $950,000/$10.6m 8.96 percent.

22. Explain the process of calculating risk-adjusted off-balance-sheet contingent guaranty contracts?

The first step is to convert the off-balance-sheet items to credit equivalent amounts of an on-balance-sheet item by multiplying the notional amounts by an appropriate conversion factor as given in Table 20-10. The converted amounts are then multiplied by the appropriate risk weights as if they were on-balance-sheet items.

a. What is the basis for differentiating the credit equivalent amounts of contingent guaranty contracts?

The factors used in the conversion are arbitrary selections from the list of choices approved by regulators. While a subjective relationship undoubtedly exists between the factors and the respective credit risks to the FI, no theoretical valuation models were utilized to determine the specific weights that are used.

b. On what basis are the risk weights for the credit equivalent amounts differentiated?

The appropriate risk weights depend on the counterparty risk to off-balance-sheet activity.

23. Explain how off-balance-sheet market contracts, or derivative instruments, differ from contingent guaranty contracts.

Off-balance-sheet contingent guaranty contracts in effect are forms of insurance that FIs sell to assist customers in the financial management of the customers’ businesses. FI management typically uses market contracts, or derivative instruments, to assist in the management of the FI’s asset and liability risks. For example, a loan commitment or a standby letter of credit may be provided to help a customer with another source of financing, while an over-the-counter interest rate swap likely would be used by the FI to help manage interest rate risk.

a. What is counterparty credit risk?

Counterparty credit risk is the risk that the other party in a contract may default on their payment obligations.

b. Why do exchange-traded derivative security contracts have no capital requirements?

Counterparty obligations of exchange-traded contracts are guaranteed by the exchange on which they are traded. Thus, there is no counterparty risk to the DI.

c. What is the difference between the potential exposure and the current exposure of over-the-counter derivative contracts?

The potential exposure is the portion of the credit equivalent amount that would be at risk if the counterparty to the contract defaulted in the future. The current exposure is the cost of replacing the contract if the counterparty defaulted today.

d. Why are the credit conversion factors for the potential exposure of foreign exchange contracts greater than they are for interest rate contracts?

The credit conversion factors for the potential exposure of foreign exchange contracts are greater than they are for interest rate contracts because research indicates that foreign exchange rates are more volatile than interest rates.

e. Why do regulators not allow DIs to benefit from positive current exposure values?

Regulators fear that allowing DIs to gain from a counterparty default would create risk-taking incentives that would not be in the best interests of the DI or the financial services industry.

24. What are G-SIBs? How do capital ratio requirements differ for these FIs?

As part of Basel III, the BIS imposed an additional common equity Tier I surcharge (“loss absorbency requirement”) on G-SIBs: banking groups whose distress or disorderly failure would cause significant disruption to the wider financial system and economic activity. The surcharge ranges from 1 percent to 3.5 percent to be held over and above the 7 percent minimum CET1 plus conservation buffer requirement. The purpose of the additional capital requirement is twofold: i) to reduce the probability of failure of a G-SIB by increasing their going-concern loss absorbency and ii) to reduce the extent or impact of the failure of a G-SIB on the financial system by improving global recovery and resolution frameworks.

G-SIBs are identified using a methodology developed by the BIS based on an indicator measurement approach that identifies factors that cause international contagion. The indicators were selected to capture the systemic impact of a bank’s failure, rather than the probability that the bank will fail. The indicators include bank size, interconnectedness, cross-jurisdictional (global) activity, the lack of substitutes for their services, and complexity to rank their global systemic importance. Using this methodology on an initial sample of 73 of the world’s largest banks and year-end 2009 data for each indicator, the BIS designated 27 banks as G-SIBs. Two additional banks were added to this initial list based on the home supervisor’s judgment, resulting in 29 G-SIBs headquartered in 12 countries. The number of G-SIBs can change over time reflecting changes in the systemic importance of banks. The sample of banks to be assessed will be reviewed every three years and the BIS also anticipates eventually expanding the surcharge to a wider group of financial institutions, including insurance companies and other nonbank financial institutions. The exact amount of the surcharge depends on a bank’s placement in one of five “buckets” (requiring a 1%, 1.5%, 2%, 2.5% and 3.5% surcharge, respectively) based on the bank’s score from the indicator measurement approach and may be met with CET1 capital only.

25. Identify and discuss the problems in the risk-based capital approach to measuring capital adequacy.

First the risk weights may not be true representations of the correct or necessary weights, or they may not be in the correct proportion to each other. For example, does a weight of 100 percent imply twice as much risk as a weight of 50 percent? Further, under Basel III all business loans are given a single 100 percent risk weight regardless of the risk of the business. Thus, loans made to AAA rated companies are assigned a credit risk weight of 1, as are loans made to CCC rated companies. That is, within a broad risk weight class, such as commercial loans, credit risk quality differences are not recognized. This may create perverse incentives for DIs to pursue lower quality customers thereby increasing the risk of the DI.

Second, the risk weights may not accurately measure the relative risk exposures of individual borrowers. While the change to the use of OECD country risk classifications (CRC) in Basel III removed the problems associated with the use of a non-commercial entity (e.g., S&P) to assign credit risk to sovereign loans and foreign bank loans, OECD country risk ratings have problems of their own. However, as they were developed, in 1999, CRC ratings were not intended to reflect the probability of sovereign defaults. Rather, CRCs were intended to measure the minimum risk premiums for use in the market for export credits. They are not sovereign ratings such as those described in Chapter 14. Individual CRCs are estimated by economists using a quantitative country risk assessment model, as well as qualitative input. Countries that are classified with a zero CRC rating are not subject to the quantitative model and review. Instead, OECD rules state that in these circumstances, pricing on export credits should not be less than the risk premium available in the wider market. Thus, when a country has a CRC rating of zero, it does not mean the country should have zero country risk premiums.

Third, the RBC ratio does not consider the effects of portfolio risk diversification. In effect, RBC assumes the correlation between assets is one. Fourth, rating all commercial loans with the moderate and high credit risk ratings may cause DIs to reduce lending in this area, an action that could have negative effects on the monitoring function performed by the financial services industry. Fifth, Basel II greatly raises the cost of regulation by adding new levels of complexity to the calculation of adequate capital. Sixth, implementation of Pillar 2 of Basel II may be too much to ask of regulators who will be subject to criticism that most would rather avoid. Finally, reducing bank leverage levels (through increased capital) will reduce DIs’ ROEs and make it harder for them to generate additional capital. Indeed, rather than earning traditional ROEs of more than 15 percent, many DIs will see ROEs in the range of 8 to 10 percent post–Basel III.

When added to the two new liquidity ratios introduced under Basel III that force DIs to more closely match maturities of assets and liabilities rather than “borrowing short” and “lending long” as has traditionally been a special feature of DIs, the special features of banking discussed in Chapter 1 will be reduced.

26. What is the contribution to the credit risk-adjusted asset base of the following items under Basel III requirements?

Risk

weight

a. $10 million cash reserves. 0% $0

b. $50 million 91-day U.S. Treasury bills 0 $0

c. $25 million cash items in the process

of collection. 20 $5 million

d. $5 million U.K. government bonds,

OECD CRD rated 1 0 $0

1. $5 million French short-term

government bonds, OECD CRD rated 2 20 $1 million

f. $1 million general obligation municipal

bonds 20 $200,000

g. $40 million repurchase agreements

(against U.S. Treasuries) 20 $8 million

h. $2 million loan to foreign bank, OECD rated 3 50 $1 million

i. $500 million 1-4 family home mortgages, 50 $250 million

category 1, loan-to-value ratio 80%

j. $10 million 1-4 family home mortgages, 200 $20 million

category 2, loan-to-value ratio 95%

k. $5 million 1-4 family home mortgages, 150 $7.5 million

100 days past due

l. $500 million commercial and industrial 100 $500 million

loans, AAA rated

m. $500 million commercial and industrial

loans, B- rated 100 $500 million

credit equivalent

amount

n. $100,000 performance-related standby

letters of credit to a AAA rated corporation 50 100 $50,000

o. $100,000 performance-related standby

letters of credit to a municipality issuing

general obligation bonds 50 20 $10,000

p. $7 million commercial letter of credit

to a foreign bank, OECD CRC rated 2 20 20 $280,000

q. $3 million five-year loan commitment

to a foreign government, OECD CRC rated 1 50 0 $0

r. $8 million bankers’ acceptance

conveyed to a U.S., AA rated corporation 20 100 $1,600,000

s. $17 million three-year loan commitment

to a private agent 50 100 $8.5 million

t. $17 million three-month loan commitment

to a private agent 20 100 $3.4 million

u. $30 million standby letter of credit to

back an A rated corporate issue of

commercial paper 100 100 $30 million

potential current

exposure exposure

v. $4 million five-year interest rate swap

with no current exposure 5% $0 100 $20,000

w. $6 million two-year currency swap with

$500,000 current exposure 5 500,000 100 $800,000

27. How does the leverage ratio test impact the stringency of regulatory monitoring of DI capital positions?

One of the features of the financial crisis of 2008-2009 was the accumulation of extreme on- and off-balance sheet leverage throughout the banking system. During the worst of the crisis, DIs were forced by the market to reduce leverage to an extent that intensified falling asset prices, and intensified DI losses, declines in DI capital, and the reduction in credit availability. To prevent this cycle from reoccurring, Basel III introduced a leverage ratio requirement that is intended to discourage the use of excess leverage and to act as a backstop to the risk-based capital requirements described above.

28. Third Bank has the following balance sheet (in millions), with the risk weights in parentheses.

**Assets Liabilities and Equity**

Cash (0%) $21 Deposits $176

OECD interbank deposits (20%) 25 Subordinated debt (5 years) 2

Mortgage loans (50%) 70 Cumulative preferred stock 2

Consumer loans (100%) 70 Equity 5

Reserve for loan losses (1)

Total Assets $185 Total liabilities and equity $185

The cumulative preferred stock is qualifying and perpetual. In addition, the bank has $30 million in performance-related standby letters of credit (SLCs) to a public corporation, $40 million in two-year forward FX contracts that are currently in the money by $1 million, and $300 million in six-year interest rate swaps that are currently out of the money by $2 million. Credit conversion factors follow:

Performance-related standby LCs 50%

1- to 5-year foreign exchange contracts 5%

1- to 5-year interest rate swaps 0.5%

5- to 10-year interest rate swaps 1.5%

a. What are the risk-adjusted on-balance-sheet assets of the bank as defined under the Basel Accord?

Risk-adjusted assets:

Cash 0 x 21 = $0

OECD interbank deposits 0.20 x 25 = $5

Mortgage loans 0.50 x 70 = $35

Consumer loans 1.00 x 70 = $70

Total risk-adjusted assets = $110 = $110

b. To be adequately capitalized, what are the CET1, Tier I, and total capital required for both off- and on-balance-sheet assets?

Standby LCs: $30 x 0.50 x 1.0 = $15 = $15

Foreign exchange contracts:

Potential exposure $40 x 0.05 = $2

Current exposure in the money = $0

Interest rate swaps:

Potential exposure $300 x 0.015 = $4.5

Current exposure Out-of-the money = $2

= $8.5 x 1.0 = $8.5

Total risk-adjusted on- and off-balance-sheet assets = $133.50

x 0.045

CET1 capital required $6.0075

x 0.06

Tier I capital required $8.01

x 0.08

Total capital required= $10.68

c. Disregarding the capital conservation buffer, does the bank have enough capital to meet the Basel requirements? If not, what minimum CET1, additional Tier 1, or total capital does it need to meet the requirement?

No, the bank does not have sufficient total capital to meet the Basel requirements. It needs CET1 capital of $6.0075 million, Tier I capital of $8.01 million, and total capital of $10.68 million. The bank has $5 million of CET1 capital, $7 million of Tier I capital ($5 million CET1 capital and $2 million of additional Tier I capital), and $10 million of total capital ($3 million ($2 million in subordinate debt and $1 million in reserve for loan losses) of Tier II capital).

If the bank issues $1.0075 million in CET1 capital, it will need $0.0025 million in additional Tier I capital, and no Tier II capital. With these additions the bank will have $6.0075 million of CET1 capital, $8.01 million of Tier I capital, and $11.01million of total capital.

A new balance sheet after the issuance of the new required equity is shown below. You will note that the total capital exceeds the minimum of $10.68 million.

New balance sheet:

Cash $22.01 Deposits $176

OECD interbank deposits 25 Subordinated debt (over 5 years) 2

Mortgage loans 70 Cumulative preferred stock 2.0025

Consumer loans 70 Equity 6.0075

Reserve for loan losses (1)

Total $186.01 $186.01

d. Does the bank have enough capital to meet the Basel requirements, including the capital conservation buffer requirement? If not, what minimum CET1, additional Tier 1, or total capital does it need to meet the requirement?

Total risk-adjusted on- and off-balance-sheet assets = $133.50

x 0.070

CET1 capital required including capital conservation buffer $9.345

x 0.085

Tier I capital required including capital conservation buffer $11.3475

x 0.105

Total capital required= $14.0175

No, the bank does not have sufficient total capital to meet the Basel requirements. It needs CET1 capital of $9.345 million, Tier I capital of $11.3475 million, and total capital of $14.0175 million. The bank has $5 million of CET1 capital, $7 million of Tier I capital, and $10 million of total capital.

If the bank issues $4.345 million in CET1 capital, it will need $0.0025 million in additional Tier I capital, and no Tier II capital. With these additions the banks will have $9.345 million of CET1 capital, $11.345 million of Tier I capital, and $14.345 million of total capital.

A new balance sheet after the issuance of the new required equity is shown below. You will note that the total capital exceeds the minimum of $14.0175 million.

New balance sheet:

Cash $25.3475 Deposits $176

OECD interbank deposits 25 Subordinated debt (over 5 years) 2

Mortgage loans 70 Cumulative preferred stock 2.0025

Consumer loans 70 Equity 9.345

Reserve for loan losses (1)

Total $189.3475 $189.3475

29. Third Fifth Bank has the following balance sheet (in millions), with the risk weights in parentheses.

**Assets Liabilities and Equity**

Cash (0%) $21 Deposits $133

Mortgage loans (50%) 50 Subordinated debt (> 5 years) 1

Consumer loans (100%) 70 Equity 6

Reserve for loan losses (1)

Total assets $140 Total Liabilities and equity $140

In addition, the bank has $20 million in commercial direct-credit substitute standby letters of credit to a public corporation and $40 million in 10-year FX forward contracts that are in the money by $1 million.

a. What are the risk-adjusted on-balance-sheet assets of the bank as defined under the Basel III?

Risk-adjusted on-balance-sheet assets: $21 x 0 = $0 $50 x 0.50 = 25 $70 x 1.00 = 70 Total = $95

b. What is the CET1, Tier I, and total capital required for both off- and on-balance-sheet

assets?

Standby LCs: $20 x 1.0 = $20 x 1.0 = $20

Foreign exchange contracts:

Potential exposure $40 x 0.075 = $3

Current exposure in the money = $0

= $3 x 1.0 = $ 3

Total risk-adjusted on- and off-balance-sheet assets = $118

x 0.045

CET1 capital required $5.31

x 0.06

Tier I capital required $7.08

x 0.08

Total capital required = $9.44

c. Disregarding the capital conservation buffer, does the bank have sufficient capital to meet the Basel requirements? How much in excess? How much short?

No, the bank does not have sufficient total capital to meet the Basel requirements. It needs CET1 capital of $5.31 million, Tier I capital of $7.08 million, and total capital of $9.44 million. The bank has $6 million of CET1 capital and Tier I capital, and $8 million of total capital. Thus, the bank has sufficient CET1 capital, but insufficient additional Tier I and Tier II capital.

If the bank issues $1.08 million in CET1 (or additional Tier I) capital, it will need $0.36 million in additional Tier II capital. With these additions the bank will have $7.08 million of CET1 capital, $7.08 million of Tier I capital, and $9.44 million of total capital.

A new balance sheet after the issuance of the new required equity is shown below.

**Assets Liabilities and Equity**

Cash (0%) $22.44 Deposits $133

Mortgage loans (50%) 50 Subordinated debt (> 5 years) 1.36

Consumer loans (100%) 70 Equity 7.08

Reserve for loan losses (1)

Total assets $141.44 Total Liabilities and equity $141.44

d. Does the bank have enough capital to meet the Basel requirements, including the capital conservation buffer requirement? If not, what minimum CET1, additional Tier 1, or total capital does it need to meet the requirement?

Total risk-adjusted on- and off-balance-sheet assets = $118

x 0.070

CET1 capital required including capital conservation buffer $8.26

x 0.085

Tier I capital required including capital conservation buffer $10.03

x 0.105

Total capital required= $12.39

No, the bank does not have sufficient total capital to meet the Basel requirements. It needs CET1 capital of $8.26 million, Tier I capital of $10.03 million, and total capital of $12.39 million. The bank has $6 million of CET1 capital and Tier I capital, and $8 million of total capital.

Capital conservation buffer must be met with CET1 capital. Thus, if the bank issues $4.03 million in CET1 capital, it will need $0.36 million in Tier II capital. With these additions the bank will have $10.03 million of CET1 and Tier I capital, and $12.39 million of total capital.

A new balance sheet after the issuance of the new required equity is shown below.

**Assets Liabilities and Equity**

Cash (0%) $25.39 Deposits $133

Mortgage loans (50%) 50 Subordinated debt (> 5 years) 1.36

Consumer loans (100%) 70 Equity 10.03

Reserve for loan losses (1)

Total assets $144.39 Total Liabilities and equity $144.39

30. According to SEC Rule 15C 3-1, what adjustments must securities firms make in the calculation of the book value of net worth?

Broker-dealers must calculate a market value for their net worth on a day-to-day basis and ensure that their net worth to assets ratio exceeds two percent. This process is a three-step process. First, fixed assets not readily convertible to cash are subtracted from net worth. Second, securities that cannot be publicly sold and certain other haircut deductions are subtracted. Third, other adjustments may be required. These adjustments may involve unrealized profits and losses, subordinated liabilities, contractual commitments, deferred taxes, options, commodities and commodity futures, and certain collateralized liabilities.

31. A securities firm has the following balance sheet (in millions):

Assets Liabilities and Equity

Cash $40 Five-day commercial paper $20

Debt securities 300 Bonds 550

Equity securities 500 Debentures 300

Other assets 60 Equity 30

Total assets $900 Total liabilities and equity $900

The debt securities have a coupon rate of 6 percent, 20 years remaining until maturity, and trade at a yield of 8 percent. The equity securities have a market value equal to book value, and the other assets represent building and equipment which was recently appraised at $80 million. The company has 1 million shares of stock outstanding and its price is $35 per share. Is this company in compliance with SEC Rule 15C 3-1?

The market value of the bonds held by the firm is ($60 x PVAn=20,i=8 + $1,000 x PVn=20,i=8) x 300,000 = $241,091,115.56. Thus, the market value of the assets is ($40m + $241m + $500m + $80m) = $861 million. The market value of the equity is $35 million, so the net worth to asset ratio is $35m/$861m = 0.0407 = 4.07%. Therefore, the company is in compliance with SEC Rule 15C 3-1. Note, for the balance sheet to balance, the market value of the bonds and debentures on the liability side must equal $806 million.

32. An investment bank specializing in fixed-income assets has the following balance sheet (in millions). Amounts are in market values, and all interest rates are annual unless indicated otherwise.

**Assets Liabilities and Equity**

Cash $0.5 5% 1-year Eurodollar deposits $5.0

8% 10-year Treasury-notes 6% 2-year subordinated debt

semi-annual (par = $16.0) 15.0 (par = $10.0) 10.0

Equity 0.5

Total assets $15.5 Total liabilities and equity $15.5

Assume that the haircut for all assets is 15 basis points and for all liabilities, 25 basis points (per year).

a. Does the investment bank have sufficient liquid capital to cushion any unexpected losses per the net capital rule?

Change in the value of the assets:

For 15 basis point change $15m = PVAn=20,k=?($0.64m) + PVn=20,k=?($16m)

⇒ *k* = 4.4796 x 2 = 8.9593 percent. If *k* =8.9593 + 0.15 = 9.1093/2 = 4.5546 percent,

⇒ the PV of the notes will be: PVAn=20,k=4.5546($0.64) + PVn=20,k=4.5546($16) = $14,851,114.01

And the decrease in value is $14,851,114.01 - $15.0m = - $148,885.99

Change in the value of deposits:

$5m = PVAn=1,k=?($0.25m) + PVn=1,k=?($5m) ⇒ *k* = 5 percent. If *k* = 5.0 + 0.25 = 5.25%, the value of the notes will be: PVA n=1,k=5.25($0.25m) + PVn=1,k=5.25($5m) = $4,988,123.52. And the market value will decrease by $4,988,123.52 - $5m = -11,876.49.

Change in the value of debt:

$10m = PVAn=2,k=?($0.60m) + PVn=2,k=?($10m) ⇒ *k* = 6 percent. If *k* = 6 + 0.25 = 6.25%, the value of the notes will be: PVAn=2,k=6.25($0.60) + PVn=2,k=6.25($10) = $9,954,325.26. And the decrease in value will be $9,954,325.26 - $10 = -$45,674.74.

The decline in the value of equity = $148,885.99 - $11,876.49 - $45,674.74 = $91,334.77. Yes, the investment bank does have enough cash to meet the change in interest rates.

b. What should the FI do to maintain the net minimum required liquidity?

If liquidity becomes insufficient, the FI has to increase its equity, convert some assets into cash or change the duration of its assets.

c. How does the net capital rule for investment banks differ from the capital requirements imposed on commercial banks and other depository institutions?

The differences between depository institutions and securities firms are:

(a) No netting is done for depository institutions. In securities firms, both assets and liabilities are netted.

(b) In securities firms, cash is the cushion. With DIs it is the capital (CET1, Tier I, and Tier II).

(c) Haircuts are based on years to maturity, liquidity, ratings, and other factors.

33. Identify and define the five risk categories incorporated into the life insurance risk-based capital model.

a. Asset risk–affiliate is the risk of default of assets for affiliated investments.

b. Asset risk reflects the riskiness of the asset portfolio, and it is calculated on an asset-risk-weighted basis similar to the risk-adjusted asset calculation for banks.

c. Insurance risk measures the risk of mortality (risk of death) and morbidity (risk of ill health).

d. Interest rate, credit, and market risk measures the liquidity of liabilities and their probability or ease of withdrawal as interest rates, credit risk, or market risk change. This measure is calculated on a risk-adjusted basis after classifying liabilities into three risk classes.

e. Business risk deals with the cost of insurer insolvencies.

34. A life insurance company has estimated capital requirements for each of the following risk classes: asset risk-affiliate (C0) = $2 million, asset risk-other (C1) = $5 million, insurance risk (C2) = $4 million, interest rate, credit, market risk (C3) = $1 million, and business risk (C4) = $3 million.

a. What is the required risk-based capital for the life insurance company?



=>  = $12.874 million

b. If the total surplus and capital held by the company is $11.34 million, does it meet the minimum requirements?

No. Total capital and surplus is not sufficient since (Total capital + Surplus)/RBC < 1: $11.34m/12.874m = 0.8808 = 88.08%

c. How much capital must be raised to meet the minimum requirements?

The life insurer needs to raise its total capital and surplus to $12.874 million, or a total additional amount of $1.534 million.

35. How do the risk categories in the risk-based capital model for property-casualty insurance companies differ from those of life insurance companies? What are the assumed relationships between the risk categories in the model?

The risk-based capital requirements model for property-casualty companies contains six risk categories including three categories for asset risk. Two of the asset risk factors, the credit risk factor, and the two underwriting risk factors are assumed to be independent of each other. Further the investment risk in PC affiliates is assumed to be perfectly correlated with the net amount of the other five risk categories.

36. A property-casualty insurance company has estimated the following required charges for its various risk classes (in millions):

Risk Description RBC Charge

R0 Affiliated P/C $2

R1 Fixed income 3

R2 Common stock 4

R3 Reinsurance 3

R4 Loss adjustment expense 2

R5 Written premiums 3

Total $17

a. What is the RBC charge as per the model recommended by the NAIC?

**

= $2m + $6.8557m = $8.8557 million

b. If the firm currently has $7 million in capital, what should be its surplus to meet the minimum capital requirement?

It needs to hold a minimum surplus of $1.8557 million.

**Integrated Mini Case: Calculating Capital Requirements**

A bank’s balance sheet information is shown below (in $000).

Used for answers to 1-4

On Balance Sheet Items Face Value Weight Value

Cash $121,600 0% $0

Short-term government securities (<92 days.) 5,400 0% $0

Long-term government securities (>92 days) 414,400 0% $0

Federal Reserve stock 9,800 0% $0

Repos secured by federal agencies 159,000 20% $31,800

Claims on U.S. depository institutions 937,900 20% $187,580

Loans to foreign banks, OECD CRC rated 2  1,640,000 20% $328,000

General obligations municipals 170,000 20% $34,000

Claims on or guaranteed by federal agencies 26,500 20% $5,300

Municipal revenue bonds 112,900 50% $56,450

Residential mortgages,

category 1, loan-to-value ratio 75% 5,000,000 50% $2,500,000

Commercial loans 4,667,669 100% $4,667,669

Loans to sovereigns, OECD CRC rated 3. 11,600 50% $5,800

Premises and equipment 455,000 100% $455,000

Conversion Face Credit-Equivalent Risk-Adjusted

##### Off Balance Sheet Items: Factor Value Amount Asset Value

**U.S. Government Counterparty**

Loan commitments:

< 1 year 20% $300 $60 $0

1-5 year 50% 1,140 570 0

Standby letters of credit:

Performance-related 50% 200 100 0

Direct-credit substitute 100% 100 100 0

**U.S. Depository Institutions Counterparty**

Loan commitments:

< 1 year. 20% 100 20 4

> 1 year 50% 3,000 1,500 1300

Standby letters of credit:

Performance-related 50% 200 100 20

Direct-credit substitute 100% 56,400 56,400 11,280

Commercial letters of credit: 20% 400 80 16

**State and Local Government Counterparty**

(revenue municipals)

Loan commitments:

>1 year 50% 100 50 25

Standby letters of credit:

Performance-related 50% 135,400 67,700 33,850

**Corporate Customer Counterparty**

Loan commitments:

< 1 year 20% 3,212,400 642,480 642,480

>1 year 50% 3,046,278 1,523,139 1,523,139

Standby letters of credit:

Performance-related 50% 101,543 50,772 50,772

Direct-credit substitute 100% 490,900 490,900 490,9000

Commercial letters of credit: 20% 78,978 15,796 15,796

**Sovereign Counterparty**

Loan commitments, OECD CRC rated 1:

< 1 year 20% 110,500 22,100 0

>1 year 50% 1,225,400 612,700 0

**Sovereign Counterparty**

Loan commitments, OECD CRC rated 2:

< 1 year 20% 85,000 17,000 3,400

>1 year 50% 115,500 57,750 11,500

**Sovereign Counterparty**

Loan commitments, OECD CRC rated 7:

>1 year. 50% 30,000 15,000 22,500

Interest rate market contracts:

(current exposure assumed to be zero.)

< 1 year (notional amount) 0% 2,000 0 0

> 1-5 year (notional amount) 0.5% 5,000 25 25

1. What is the bank's risk-adjusted asset base under Basel III?

The risk-adjusted asset base under Basel III is:

On-balance-sheet risk-adjusted asset base $8,271,599

Off-balance-sheet risk-adjusted asset base $2,806,007

Total risk-adjusted asset base $11,077,606

2. To be adequately capitalized, what are the bank's CET1, Tier I, and total risk-based capital requirements under Basel III?

Under Basel III: CET1 = 4.5% capital requirement x $11,077,606 = 498,492

Tier I = 6% capital requirement x $11,077,606 = $664,656

Tier II = 8% capital requirement x $11,077,606 = $886,208

3. Using the leverage ratio requirement, what is the minimum regulatory capital required to keep the bank in the well-capitalized zone?

The bank has $13,731,769 in total assets. The minimum regulatory Tier I capital at 5% is $686,588.

4. Disregarding the capital conservation buffer, what is the bank's capital adequacy level (under Basel III) if the par value of its equity is $225,000, surplus value of equity is $200,000, retained earnings is $565,545, qualifying perpetual preferred stock is $50,000, subordinate debt is $50,000, and loan loss reserve is $85,000? Does the bank meet Basel (CET1, Tier I, and Tier II) adequate capital standards? Does the bank comply with the well-capitalized leverage ratio requirement?

CET1 capital = $225,000 + $200,000 + $565,545 = $990,545; Tier I capital = $990,545 + $50,000 = 1,040,545; and total capital = 1,040,545 + $50,000 + $85,000 = $1,175,545. Yes, the bank meets the Basel III standards for adequate capital because CET1 capital is above 4.5% ($990,545/$11,077,606 = 8.94%), Tier I capital is above 6% ($1,040,545/$11,077,606 = 9.39%), and total capital is above 8% ($1,175,545/$11,077,606 = 10.61%). The bank also complies with the well-capitalized: the CET1 capital is above 6.5%, Tier I capital is above 8%, and total capital is above 10%.

5. Does the bank have enough capital to meet the Basel requirements, including the capital conservation buffer requirement?

The bank does have sufficient capital to meet the capital conservation buffer: the CET1 capital is above 7.0%, Tier I capital is above 8.5%, and total capital is above 10.5%.

6. The bank’s various lines of business produced the following gross income:

Retail banking $40,000

Commercial banking 50,000

Payment and settlement 15,000

Trading and sales 5,000

Asset management 10,000

What is the add-on to capital for operational risk? Does the bank have sufficient capital to cover this add-on and remain adequately capitalized, while meeting the capital conservation buffer?

The add-on capital requirement for operational risk is:

[($40,000 x 0.12) + ($50,000 x 0.15) + ($15,000 x 0.18) + ($5,000 x 0.18) + ($10,000 x 0.12)] x 0.12 = $17,100 x 0.12 = $2,052

To cover this add-on and remain adequately capitalized while meeting the capital conservation buffer: CET1 = (7% capital requirement x $11,077,606) + $2,052 = 777,484

Tier I = (8.5% capital requirement x $11,077,606) + $2,052 = $943,648

Tier II = (10.5% capital requirement x $11,077,606) + $2,052 = $1,165,201

The bank has more than these amounts, so does remain adequately capitalized.