ΑΣΚΗΣΕΙΣ – Κεφάλαιο 6

(Κεφαλαιακή Επάρκεια)

❖ **20.5, 20.16, 20.18, 20.21, 20.23, 20.25, 20.26, 20.27, 20.28, 20.29, 20.32**

20.5 *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?

ANSWER: 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.

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

ANSWER: 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.

20.18. National Bank of Country X has the following balance sheet (in millions), with 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?

ANSWER: Risk-adjusted assets = $20x0.0 + $40x0.0 + $600x0.5 + $430x1.0 = $730.
The CET1 risk-based ratio is ($45 + $40)/$730 = 0.11644 or 11.644 percent.

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

ANSWER: The same as CET1

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

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

d. What is the leverage ratio?

ANSWER: 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?

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

20.21. *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?*

NOTE: Based on the above data, 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. What will the new value of each ratio be?

ANSWER: 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. What will the new value of each ratio be?

ANSWER: 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. What will the new value of each ratio be?

ANSWER: 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. What will the new value of each ratio be?

ANSWER: 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 non-qualifying perpetual preferred stock and purchases general obligation municipal bonds. What will the new value of each ratio be?

ANSWER: 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 half of the the proceeds to build new ATMs. What will the new value of each ratio be?

ANSWER: 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.

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

ANSWER: 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?

ANSWER: 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?

ANSWER: 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?

ANSWER: 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?

ANSWER: 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?

ANSWER: 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.

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

ANSWER:

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.

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

	ΣΤΟΙΧΕΙΟ ΙΣΟΛΟΓΙΣΜΟΥ	Risk weight	**ΑΠΑΝΤΗΣΗ**
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
e.	$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, category 1, loan-to-value ratio 80%	50	$250 million
j.	$10 million 1-4 family home mortgages, category 2, loan-to-value ratio 95%	200	$20 million
k.	$5 million 1-4 family home mortgages, 100 days past due	150	$7.5 million
l.	$500 million commercial and industrial loans, AAA rated	100	$500 million
m.	$500 million commercial and industrial loans, B- rated	100	$500 million

		credit-equivalent amount		**ΑΠΑΝΤΗΣΗ**
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 exposure	current exposure		**ΑΠΑΝΤΗΣΗ**
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

20.27. *How does the leverage ratio test impact the stringency of regulatory monitoring of Depository Instiurions' capital positions?*

ANSWER: 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.

20.28. 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?

ANSWER:

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?

ANSWER:

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?

ANSWER: 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?

ANSWER:

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

20.29. *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?

ANSWER:

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?

ANSWER:

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?

ANSWER: 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?

ANSWER:

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

20.32. 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?

ANSWER: Change in the value of the assets:

For 15 basis point change \$15m = $PVA_{n=20,k=?}(\$0.64m) + PV_{n=20,k=?}(\$16m)$

$\Rightarrow k = 4.4796 \times 2 = 8.9593$ percent. If $k = 8.9593 + 0.15 = 9.1093/2 = 4.5546$ percent,

$\Rightarrow$ the PV of the notes will be: $PVA_{n=20,k=4.5546}(\$0.64) + PV_{n=20,k=4.5546}(\$16) = \$14,851,114.01$

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

Change in the value of deposits:

\$5m = $PVA_{n=1,k=?}(\$0.25m) + PV_{n=1,k=?}(\$5m) \Rightarrow k = 5$ percent. If $k = 5.0 + 0.25 = 5.25\%$, the value of the notes will be: $PVA_{n=1,k=5.25}(\$0.25m) + PV_{n=1,k=5.25}(\$5m) = \$4,988,123.52$. And the market value will decrease by \$4,988,123.52 - \$5m = -11,876.49.

Change in the value of debt:

\$10m = $PVA_{n=2,k=?}(\$0.60m) + PV_{n=2,k=?}(\$10m) \Rightarrow k = 6$ percent. If $k = 6 + 0.25 = 6.25\%$, the value of the notes will be: $PVA_{n=2,k=6.25}(\$0.60) + PV_{n=2,k=6.25}(\$10) = \$9,954,325.26$. 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?

ANSWER: 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?

ANSWER: 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.