measures for net gammas on short positions plus the absolute value of the sum of the individual measures for vega risk.

f. Under certain conditions and to a limited extent, the FDIC may permit banks that are significant traders in options with debt securities or interest rates as the underlying to net gammas on long and short positions and vegas across time bands. Such netting must be based on prudent and conservative assumptions and the bank must materially meet the qualitative standards set forth in section III.B. of this appendix C.

g. A bank may base the calculation of vega risk on a volatility ladder in which the implied change in volatility varies with the maturity of the option. The assumed proportional shift in volatility must be at least ±25.0 percent at the short end of the maturity spectrum. The proportional shift for longer maturities must be at least as stringent in statistical terms as the 25.0 percent shift at the short end.

h. A bank should also monitor the risks of rho (the rate of change of the value of the option with respect to the interest rate) and theta (the rate of change of the value of the option with respect to time).

Attachments to Appendix C

Attachment I—Sample Calculation of Eligible Tier 1, Tier 2, and Tier 3 Capital for the Risk-Based Capital Ratio Adjusted for Market Risk

a. In each example the weighted-risk assets are $8000 and the market risk-adjusted assets are $625 (capital requirement for market risk=$50 $50×12.5=$625):

Example 1: A bank has the following qualifying capital: Tier 1=$600, Tier 2=$100, Tier 3=$1000.

(1) The minimum capital requirement for credit risk is $640 ($8000×8.0%). This requirement could be satisfied with $540 of Tier 1 capital and $100 of Tier 2 capital.

(2) The remaining capital available for market risk would be: Tier 1=$60, Tier 2=0, and Tier 3=$1000. The minimum capital requirement for market risk is $50 ($625×8.0%). Eligible Tier 3 capital would be limited to $125 ($50×2.5).

(3) The Tier 1 capital required to support market risk could be satisfied by allocating $14 ($50×.285), with eligible Tier 3 capital used for market risk being $36 ($50×$14).

(4) Total qualifying and eligible capital would be: $540 (Tier 1)+$100 (Tier 2)+$60 (Tier 1, comprising $14 allocated for market risk and $46 unallocated)+$36 (Tier 3)=$736. The bank's ratio of qualifying and eligible capital to weighted-risk assets adjusted for market risk would be: $736/$8,625)=8.5%.

Example 2: A bank has the following qualifying capital: Tier 1=$500, Tier 2=$140, Tier 3=$600.

(1) The minimum capital requirement for credit risk is $640 ($8000×8.0%). This requirement could be satisfied with $500 of Tier 1 capital and $140 of Tier 2 capital.

(2) The remaining capital available for market risk would be: Tier 1=0, Tier 2=$0, and Tier 3=$600. Eligible Tier 3 capital would be limited to $0 (0×2.5). Because there is no Tier 1 capital required to support market risk, no eligible Tier 3 capital may be used for market risk.

(3) Total qualifying and eligible capital would be: $500 (Tier 1)+$140 (Tier 2)=$640. The bank's ratio of qualifying and eligible capital to weighted-risk assets adjusted for market risk would be: $640/$8,625)=7.4%

b. In both of the examples described in paragraph a. of this attachment the total of Tier 2 and Tier 3 capital for credit and market risk is not greater than 100 percent of Tier 1 capital for credit and market risk and the total of Tier 2 capital for credit risk is not greater than 100 percent of Tier 1 capital for credit risk.

Attachment II—Sample Calculation of General Market Risk for Debt Instruments Using the Maturity Method

a. A bank with the following positions would allocate them into a maturity ladder as shown below:

i. Qualifying bond, $13.33mn market value, remaining maturity 8 years, coupon 8%;

ii. Government bond, $75mn market value, remaining maturity 2 months, coupon 7%;

iii. Interest rate swap, $150mn, bank receives floating rate interest and pays fixed, next interest reset after 12 months, remaining life of swap is 8 years (assumes the current interest rate is identical to the one the swap is based on); and

iv. Long position in interest rate future, $50mn, delivery date after 6 months, life of underlying government security is 3.5 years (assumes the current interest rate is identical to the one the swap is based on).

Zone	Time band and position	Risk weight [%]	Risk-weighted position	Net time-band positions	Net zone positions
1	0–1 Month	0.00			
	1–3 Months	0.20	Long 0.15	Long 0.15	Long 1.00
	Long 75 Gov. Bond.				
	3–6 Months	0.40	Short 0.20	Short 0.20.	
	Short 50 Future.				
	6–12 Months	0.70	Long 1.05	Long 1.05.	
	Long 150 Swap.				
2	1–2 yrs	1.25			
	2–3 yrs	1.75			
	3–4 yrs	2.25	Long 1.125	Long 1.125	Long 1.125
	Long 50 Future.				
3	4–5 yrs	2.75			
	5–7 yrs	3.25			
	7–10 yrs	3.75	Short 5.625	Short 5.125	Short 5.125
	Short 150 Swap.				
	Long 13.33		Long 0.50.		
	Qual. Bond.				
	10–15 yrs	4.50			
	15–20 yrs	5.25			
	Over 20 yrs	6.00			

b. A vertical disallowance would be calculated for time band 7–10 years. It would be 10 percent of the positions eliminated by netting in the time band—10.0 x 0.5 = 0.05 ($50,000).

c. A horizontal disallowance would be calculated for zone 1. It would be 40 percent of the positions eliminated by netting in the zone—40.0 x 0.20 = 0.80 ($80,000). The remaining net position in zone 1 would be long 1.00.

d. A horizontal disallowance would be calculated for adjacent zones 2 and 3. It would be 40 percent of the positions eliminated by netting between the zones—40.0 x 1.125 = 0.45 ($450,000). The remaining position in zone 3 would be short 4.00.

e. A horizontal disallowance would be calculated between zones 1 and 3. It would be 100 percent of the positions eliminated by netting between the zones—100 x 1.00 = 1.00 ($1,000,000).

f. The remaining net open position for the bank would be 3.00 ($3,000,000). The total capital requirement for general market risk for this portfolio would be:

The vertical disallowance	$50,000
Horizontal disallowance in zone 1	80,000