

combination of the two approaches deemed to be appropriate by the Federal Reserve.

2. *Internal Models.* a. For a bank approved to use the internal models approach, the capital requirement for market risk is the higher of:

i. The bank's previous day's aggregate value-at-risk amount calculated subject to certain supervisory requirements set forth in section III. of this appendix E; or

ii. An average of the daily aggregate value-at-risk amounts, calculated subject to the same restrictions, measured on each of the preceding sixty (60) business days, multiplied by a minimum "multiplication factor" of three (3).<sup>8</sup>

b. A bank approved to use the internal models approach may also be subject to a separate capital requirement for specific market risk of traded debt and equity instruments to the extent that the specific market risk associated with these instruments is not captured by the bank's models. However, for all banks using internal models, the total specific risk charge should in no case be less than one-half the specific risk charges calculated according to the standardized approach.

3. *Standardized approach.* A bank whose model has not been approved by the Federal Reserve must use the standardized approach for measuring its market risk. For a bank using this approach, the capital requirement for market risk is the sum of the market risk capital requirement for debt and equity instruments in the trading account, foreign exchange and commodities risk throughout the bank, and options and other derivative positions in each risk category as set forth in sections IV.A. to IV.E. of this appendix E.<sup>9</sup>

4. *Partial models.* a. With approval from the Federal Reserve, a bank whose internal model does not cover all risk factor categories may use the standardized approach to measure market risk exposure arising from the risk factor categories that are not covered. The Federal Reserve will approve combining the two approaches only on a temporary basis in situations where the bank is developing, but has not fully implemented, a comprehensive value-at-risk measurement system. When a bank uses both approaches, each risk factor category (that is, interest rates, exchange rates, equity prices, and commodity prices) must be measured using one or the other approach. The methods may not be combined within a risk factor

category. Once a bank adopts an acceptable value-at-risk model for a particular risk factor category, it may not revert to the standardized approach except in unusual circumstances and with prior approval of the Federal Reserve.

b. For a bank using a combination of approaches, the capital requirement for market risk is the sum of (i) the appropriate value-at-risk amount (as determined under section I.C.2.a. of this appendix E), and (ii) the capital requirement for each risk category that is calculated using the standardized approach.

5. *Application.* The capital requirements for market risk apply to state member banks on a worldwide consolidated basis. The Federal Reserve may, however, evaluate market risk on an unconsolidated basis when necessary. For example, when there are obstacles to the repatriation of profits from a foreign subsidiary or where management structure does not allow timely management of risk on a consolidated basis.

6. *Other considerations.* All transactions, including forward sales and purchases, should be included in the calculation of market risk capital requirements from the date on which they were entered into. The Federal Reserve expects a bank to meet its capital requirements for market risk on a continuous basis (that is, at a minimum, at the close of each business day).

## II. Qualifying Capital and the Market Risk-Adjusted Capital Ratio

### A. Qualifying and Eligible Capital

1. The principal forms of qualifying capital for market risk are Tier 1 capital and Tier 2 capital as defined in section II. of appendix A of this part and subject to the conditions and limitations of appendix A of this part. A bank may use Tier 3 capital for the sole purpose of meeting a portion of the capital requirements for market risk.<sup>10</sup>

2. Tier 3 capital consists of short-term subordinated debt that is subject to a lock-in clause providing that neither interest nor principal payment is due (even at maturity) if such payment would cause the issuing bank to fall or remain below the minimum 8.0 percent risk-based capital requirement as set forth in appendix A and adjusted for market risk.

3. In order to qualify as Tier 3 capital, the short-term debt must be unsecured, subordinated, and fully paid up; it must have an original maturity of at least two years; and it may not be redeemed before maturity without prior approval by the Federal Reserve. In addition, it may not contain or be covered by any covenants, terms, or restrictions that are inconsistent with safe and sound banking practices.

4. Eligible Tier 3 capital may not exceed 250 percent of a bank's Tier 1 capital allocated for market risk and the maximum eligible amount of Tier 2 and Tier 3 capital together is limited to 100 percent of Tier 1

capital. (Examples of how to calculate these limits are set forth in Attachment I to this appendix E.) Tier 2 elements may be substituted for Tier 3 up to the same limit of 250 percent, so long as the overall limits for Tier 2 capital set forth in appendix A of this part are not exceeded, that is, Tier 2 capital may not exceed total Tier 1 capital, and long-term subordinated debt may not exceed 50 percent of Tier 1 capital.

### B. Calculation of Eligible Capital and the Capital Ratio

1. In order to calculate eligible capital, a bank must first calculate its minimum capital requirement for credit risk in accordance with appendix A of this part and then its capital requirement for market risk. Eligible capital is the sum of the bank's qualifying Tier 1 capital, its qualifying Tier 2 capital subject to the limits stated above, and its eligible Tier 3 capital subject to the conditions set out under section II. of this appendix E.

2. A bank that is subject to the market risk measure must calculate its risk-based capital ratios as follows:

a. Determine total weighted-risk assets using the procedures and criteria set forth in appendix A of this part, excluding debt and equity instruments in the trading book and positions in commodities, but including all over-the-counter derivative activities whether in the bank's trading account or not.

b. Calculate the measure for market risk using the internal models approach, the standardized approach, or an approved combination of these two approaches.

c. Multiply the measure for market risk by 12.5 (i.e., the reciprocal of the 8.0 percent minimum risk-based capital ratio). The resulting product is referred to as "market risk-equivalent assets."

d. Add market risk-equivalent assets to the weighted-risk assets compiled for credit risk purposes (section II.B.2.a. of this appendix E). The sum of these two amounts is the denominator of risk-based capital ratios adjusted for market risk. The numerator of the total risk-based capital ratio is eligible capital and the numerator of the Tier 1 risk-based capital ratio is Tier 1 capital.

## III. The Internal Models Approach

### A. Use of Models

1. With prior approval of the Federal Reserve, a bank may use its internal risk measurement model(s) for purposes of measuring value-at-risk and determining the associated regulatory capital requirements for market risk exposure.

a. Requests for approval under section III.A.1. of this appendix E should include, at a minimum, a complete description of the bank's internal modeling and risk management systems and how these systems conform to the criteria set forth in this section III., an explanation of the policies and procedures established by the bank to ensure continued compliance with such criteria, a discussion of internal and external validation procedures, and a description of other relevant policies and procedures consistent with sound practices.

b. The Federal Reserve will approve an internal model for regulatory capital

<sup>8</sup> The Federal Reserve may adjust the multiplication factor for a bank to increase its capital requirement based on an assessment of the quality and historic accuracy of the bank's risk management system.

<sup>9</sup> Section IV.E. of this appendix E provides several alternatives for measuring the market risk of options. Under two of the alternatives, the simplified and scenario methods, the underlying position of an option is "carved-out," and is not included in the prescribed risk measure for the underlying. Instead it is evaluated together with the related option according to the procedures described for options to determine the capital requirement. Under the third alternative, the "delta-plus" approach, the delta-equivalent value of each position is included in the measurement framework for the appropriate risk category (that is, debt or equity instruments in the trading account, foreign exchange or commodities risk).

<sup>10</sup> A bank may not use Tier 3 capital to satisfy any capital requirements for counterparty credit risk under appendix A of this part, including counterparty credit risk associated with derivative transactions in either trading or non-trading accounts.