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to determine its market risk exposure. The qualifying internal market risk model may use any generally accepted measurement technique including, but not limited to, variance-covariance models, historical simulations, or monte carlo simulations; however, the qualifying internal market risk model must capture all material market risk.

(a) Value-at-risk measurement. A qualifying internal market risk model must incorporate a value-at-risk measurement that adequately evaluates the market risk associated with all covered market risk assets.

(b) *Risk factor categories.* The value-at-risk measurement must include risk factors sufficient to capture the market risk inherent in all covered market risk assets. In addition, the risk factors must cover the risk categories of interest rates, exchange rates, equity prices, commodity prices, and the volatility of related market factors.

(c) *Prior approval.* Prior OCC approval is required before a bank may use an internal market risk model for the purposes of the market risk requirement of this appendix B. A qualifying internal market risk model must satisfy the following criteria:

(1) *Qualitative factors.* (i) The level of sophistication and accuracy of the internal market risk model must be commensurate with the nature and volume of bank's trading account activities.

(ii) The market risk management systems must adequately monitor compliance with internal procedures and controls which generally would include independent risk management, annual internal audits, back testing, and stress testing.

(2) *Quantitative factors.* (i) The value-atrisk measurement must be calculated with sufficient frequency to allow the bank enough time to react to changing market conditions.

(ii) The value-at-risk measurement must be based on a 99th percentile, one-tailed confidence interval² with an assumed holding period of ten trading days.

(iii) For positions that display linear price relationships, a bank may use value-at-risk measurement using shorter holding periods which are scaled up to ten days by the square root of time.³

(iv) The value-at-risk measurement must be calculated using an observation period of at least one year to measure historical changes in rates and prices.

(v) A bank must update its historical rates and prices at least once every three months and must reassess them whenever market conditions change materially.

(vi) A bank may incorporate into its valueat-risk measurement empirical correlations

³ This transformation entails multiplying a bank's value-at-risk by the square root of the ratio of the required holding period (ten days) to the holding period embodied in the value-at-risk exposure. For example, the value-at-risk calculated according to a one-day holding period would be scaled-up by the "square root of time" by multiplying the value-at-risk by 3.16 (the square root of the ratio of a ten-day holding period to a one-day holding period).

within each risk category. However, empirical correlations across risk categories may not be incorporated. The value-at-risk measurement for each risk category must be added together on a simple sum basis to determine the aggregate value-at-risk exposure.

(vii) The value-at-risk measurement must capture the unique risks associated with options within each of the risk categories subject to the following criteria:

(Å) The value-at-risk measurement must capture the non-linear price characteristics of option positions using an options pricing technique.

(B) The bank must apply a minimum tenday holding period to option positions or positions that display option-like characteristics. Options may not be scale-up the daily value-at-risk exposure by the square root of time.

(C) The value-at-risk measurement must capture the volatilities of the rates and prices underlying option positions.

(viii) The accuracy of a bank's qualifying internal market risk model must be validated by auditors.

Section 6. Standardized Market Risk Model

As provided in this section, a bank may use the standardized market risk model to determine its market risk exposure.

(a) Debt Instruments. (1) Specific Risk. (i) The market risk requirement for specific risk is based on the identity of the obligor and, in the case of corporate securities, on the credit rating and maturity of the instrument. The specific risk is calculated by weighting the current market value of each individual position, whether long or short, by the appropriate specific risk factor and summing the weighted values. In measuring specific risk, the bank may offset and exclude from its calculations any matched positions in the identical issue (including positions in derivative contracts). Even if the issuer is the same, offsetting is not permitted between different issues. The specific risk factors are set forth in Table 1-Specific Risk Factors for Debt Instruments, as follows:

TABLE 1.—SPECIFIC RISK FACTORS FOR DEBT INSTRUMENTS

Category	Remaining contractual maturity	Factor (In percent)
Government Qualifying	N/A 6 months or	0.00 0.25
	less. Over 6 to 12	1.00
	Over 12	1.60
Other	N/A	8.00

(ii) The government category includes all forms of debt instruments of central governments of the OECD-based group of countries including bonds, Treasury bills and other short-term instruments, as well as local currency instruments of non-OECD central governments to the extent that the bank has liabilities booked in that currency.

(iii) The qualifying category includes securities of U.S. government-sponsored agencies, general obligation securities issued by states and other political subdivisions of the OECD-based group of countries, multilateral development banks, and debt instruments issued by U.S. depository institutions or OECD-banks that do not qualify as capital of the issuing institution. It also includes other securities, including revenue securities issued by states and other political subdivisions of the OECD-based group of countries, that are rated investmentgrade by at least two nationally recognized credit rating services, or rated investmentgrade by one nationally recognized credit rating agency and not less than investmentgrade by any other credit rating agency, or, with the exception of securities issued by U.S. firms and subject to review by the OCC, unrated but deemed to be of comparable investment quality by the reporting bank and the issuer has securities listed on a recognized stock exchange.

(iv) The other category includes debt securities not qualifying as government or qualifying securities. This would include non-OECD central government securities that do not meet the criteria for the government or qualifying categories. This category also includes instruments that qualify as capital issued by other banking organizations.

(v) The OCC will consider the extent of a bank's position in non-investment grade instruments (sometimes referred to as "high yield debt") that do not have investmentgrade ratings. If those holdings are not welldiversified or otherwise represent a material position to the institution, the OCC may prohibit a bank from offsetting positions in these instruments with other positions in qualifying instruments that may be offset when calculating its general market risk requirement. In addition, the OCC may impose a specific risk capital requirement as high as 16.0 percent.

(2) General Market Risk. (i) A bank may measure its exposure to general market risk using, on a continuous basis, either the maturity method (which uses standardized risk weights that approximate the price sensitivity of various instruments) or the duration method (where the institution calculates the precise duration of each instrument, weighted by a specified change in interest rates).

(ii) Both methods use a maturity-ladder that incorporates a series of "time bands" and "zones" to group together securities of similar maturities and that are designed to take into account differences in price sensitivities and interest rate volatilities across different maturities. Under either method, the capital requirement for general market risk is the sum of a base charge that results from fully netting various riskweighted positions and a series of additional charges (add-ons), which effectively "disallow" part of the previous full netting to address basis and yield curve risk.

(iii) For each currency in which a bank has significant positions, a separate capital requirement must be calculated. No netting of positions is permitted across different currencies. Offsetting positions of the same amount in the same issues, whether actual or

² A one-tailed confidence interval of 99 percent means that there is a 1 percent probability based on historical experience that the combination of positions in a bank's portfolio would result in a loss higher than the measured value-at-risk.