derivative contract that is not a credit derivative is the EAD of the derivative as calculated in § 3.132.

§ 3.132 Counterparty credit risk of repo-style transactions, eligible margin loans, and OTC derivative contracts.

(a) *Methodologies for collateral recognition.* (1) Instead of an LGD estimation methodology, a national bank or Federal savings association may use the following methodologies to recognize the benefits of financial collateral in mitigating the counterparty credit risk of repo-style transactions, eligible margin loans, collateralized OTC derivative contracts and single product netting sets of such transactions, and to recognize the benefits of any collateral in mitigating the counterparty credit risk of repo-style transactions that are included in a national bank's or Federal savings association's VaR-based measure under subpart F of this part:

(i) The collateral haircut approach set forth in paragraph (b)(2) of this section;

(ii) The internal models methodology set forth in paragraph (d) of this section; and

(iii) For single product netting sets of repo-style transactions and eligible margin loans, the simple VaR methodology set forth in paragraph (b)(3) of this section.

(2) A national bank or Federal savings association may use any combination of the three methodologies for collateral recognition; however, it must use the same methodology for transactions in the same category.

(3) A national bank or Federal savings association must use the methodology in paragraph (c) of this section, or with prior written approval of the OCC, the internal model methodology in paragraph (d) of this section, to calculate EAD for an OTC derivative contract or a set of OTC derivative contracts subject to a qualifying master netting agreement. To estimate EAD for qualifying cross-product master netting agreements, a national bank or Federal savings association may only use the internal models methodology in paragraph (d) of this section.

(4) A national bank or Federal savings association must also use the methodology in paragraph (e) of this section to calculate the risk-weighted asset amounts for CVA for OTC derivatives.

(b) *EAD for eligible margin loans and repo-style transactions*—(1) *General.* A national bank or Federal savings association may recognize the credit risk mitigation benefits of financial collateral that secures an eligible margin loan, repo-style transaction, or single-product netting set of such transactions by factoring the collateral into its LGD estimates for the exposure. Alternatively, a national bank or Federal savings association may estimate an unsecured LGD for the exposure, as well as for any repo-style transaction that is included in the national bank's or Federal savings association's VaR-based measure under subpart F of this part, and determine the EAD of the exposure using:

(i) The collateral haircut approach described in paragraph (b)(2) of this section;

(ii) For netting sets only, the simple VaR methodology described in paragraph (b)(3) of this section; or

(iii) The internal models methodology described in paragraph (d) of this section.

(2) *Collateral haircut approach*—(i) *EAD equation.* A national bank or Federal savings association may determine EAD for an eligible margin loan, repo-style transaction, or netting set by setting EAD equal to max

$$\{0, [(\Sigma E - \Sigma C) + \Sigma(E_s \times H_s) + \Sigma(E_{fx} \times H_{fx})]\},$$

where:

(A) ΣE equals the value of the exposure (the sum of the current fair values of all instruments, gold, and cash the national bank or Federal savings association has lent, sold subject to repurchase, or posted as collateral to the counterparty under the transaction (or netting set));

(B) ΣC equals the value of the collateral (the sum of the current fair values of all instruments, gold, and cash the national bank or Federal savings association has borrowed, purchased subject to resale, or taken as collateral from the counterparty under the transaction (or netting set));

(C) E_s equals the absolute value of the net position in a given instrument or in gold (where the net position in a given instrument or in gold equals the sum of the current fair values of the instrument or gold the national bank or Federal savings association has lent, sold subject to repurchase, or posted as collateral to the counterparty minus the sum of the current fair values of that same instrument or gold the national bank or Federal savings association has borrowed, purchased subject to resale, or taken as collateral from the counterparty);

(D) H_s equals the market price volatility haircut appropriate to the instrument or gold referenced in E_s;

(E) E_{fx} equals the absolute value of the net position of instruments and cash in a currency that is different from the settlement currency (where the net position in a given currency equals the sum of the current fair values of any instruments or cash in the currency the national bank or Federal savings association has lent, sold subject to repurchase, or posted as collateral to the counterparty minus the sum of the current fair values of any instruments or cash in the currency the national bank or Federal savings association has borrowed, purchased subject to resale, or taken as collateral from the counterparty); and

(F) H_{fx} equals the haircut appropriate to the mismatch between the currency referenced in E_{fx} and the settlement currency.

(ii) *Standard supervisory haircuts.* (A) Under the standard supervisory haircuts approach:

(*1*) A national bank or Federal savings association must use the haircuts for market price volatility (H_s) in Table 1 to § 3.132, as adjusted in certain circumstances as provided in paragraphs (b)(2)(ii)(A)(*3*) and (*4*) of this section;

TABLE 1 TO § 3.132—STANDARD SUPERVISORY MARKET PRICE VOLATILITY HAIRCUTS [1]

Residual maturity	Haircut (in percent) assigned based on:						Investment grade securitization exposures (in percent)
	Sovereign issuers risk weight under this section [2] (in percent)			Non-sovereign issuers risk weight under this section (in percent)			
	Zero	20 or 50	100	20	50	100	
Less than or equal to 1 year	0.5	1.0	15.0	1.0	2.0	4.0	4.0
Greater than 1 year and less than or equal to 5 years	2.0	3.0	15.0	4.0	6.0	8.0	12.0
Greater than 5 years	4.0	6.0	15.0	8.0	12.0	16.0	24.0
Main index equities (including convertible bonds) and gold	15.0						
Other publicly traded equities (including convertible bonds)	25.0						
Mutual funds	Highest haircut applicable to any security in which the fund can invest. ROW RUL='s●'≤						
Cash collateral held	Zero						
Other exposure types	25.0						

[1] The market price volatility haircuts in Table 1 to § 3.132 are based on a 10 business-day holding period.
[2] Includes a foreign PSE that receives a zero percent risk weight.

(*2*) For currency mismatches, a national bank or Federal savings association must use a haircut for foreign exchange rate volatility (H_{fx}) of 8 percent, as adjusted in certain circumstances as provided in paragraphs (b)(2)(ii)(A)(*3*) and (*4*) of this section.

(*3*) For repo-style transactions, a national bank or Federal savings association may multiply the supervisory haircuts provided in paragraphs (b)(2)(ii)(A)(*1*) and (*2*) of this section by the square root of ½ (which equals 0.707107).

(*4*) A national bank or Federal savings association must adjust the supervisory haircuts upward on the basis of a holding period longer than ten business days (for eligible margin loans) or

five business days (for repo-style transactions) where the following conditions apply. If the number of trades in a netting set exceeds 5,000 at any time during a quarter, a national bank or Federal savings association must adjust the supervisory haircuts upward on the basis of a holding period of twenty business days for the following quarter (except when a national bank or Federal savings association is calculating EAD for a cleared transaction under §3.133). If a netting set contains one or more trades involving illiquid collateral or an OTC derivative that cannot be easily replaced, a national bank or Federal savings association must adjust the supervisory haircuts upward on the basis of a holding period of twenty business days. If over the two previous quarters more than two margin disputes on a netting set have occurred that lasted more than the holding period, then the national bank or Federal savings association must adjust the supervisory haircuts upward for that netting set on the basis of a holding period that is at least two times the minimum holding period for that netting set. A national bank or Federal savings association must adjust the standard supervisory haircuts upward using the following formula:

$$H_A = H_S\sqrt{\frac{T_M}{T_S}}\text{, where,}$$

(*i*) T_M equals a holding period of longer than 10 business days for eligible margin loans and derivative contracts or longer than 5 business days for repo-style transactions;

(*ii*) H_s equals the standard supervisory haircut; and

(*iii*) T_s equals 10 business days for eligible margin loans and derivative contracts or 5 business days for repo-style transactions.

(*5*) If the instrument a national bank or Federal savings association has lent, sold subject to repurchase, or posted as collateral does not meet the definition of financial collateral, the national bank or Federal savings association must use a 25.0 percent haircut for market price volatility (Hs).

(iii) *Own internal estimates for haircuts.* With the prior written approval of the OCC, a national bank or Federal savings association may calculate haircuts (H_s and H_{fx}) using its own internal estimates of the volatilities of market prices and foreign exchange rates.

(A) To receive OCC approval to use its own internal estimates, a national bank or Federal savings association must satisfy the following minimum quantitative standards:

(*1*) A national bank or Federal savings association must use a 99th percentile one-tailed confidence interval.

(*2*) The minimum holding period for a repo-style transaction is five business days and for an eligible margin loan is ten business days except for transactions or netting sets for which paragraph (b)(2)(iii)(A)(*3*) of this section applies. When a national bank or Federal savings association calculates an own-estimates haircut on a T_N-day holding period, which is different from the minimum holding period for the transaction type, the applicable haircut (H_M) is calculated using the following square root of time formula:

$$H_M = H_N\sqrt{\frac{T_M}{T_N}}\text{, where}$$

(*i*) T_M equals 5 for repo-style transactions and 10 for eligible margin loans;

(*ii*) T_N equals the holding period used by the national bank or Federal savings association to derive H_N; and

(*iii*) H_N equals the haircut based on the holding period T_N

(*3*) If the number of trades in a netting set exceeds 5,000 at any time during a quarter, a national bank or Federal savings association must calculate the haircut using a minimum holding period of twenty business days for the following quarter (except when a national bank or Federal savings association is calculating EAD for a cleared transaction under §3.133). If a netting set contains one or more trades involving illiquid collateral or an OTC derivative that cannot be easily replaced, a national bank or Federal savings association must calculate the haircut using a minimum holding period of twenty business days. If over the two previous quarters more than two margin disputes on a netting set have occurred that lasted more than the holding period, then the national bank or Federal savings association must calculate the haircut for transactions in that netting set on the basis of a holding period that is at least two times the minimum holding period for that netting set.

(*4*) A national bank or Federal savings association is required to calculate its own internal estimates with inputs calibrated to historical data from a continuous 12-month period that reflects a period of significant financial stress appropriate to the security or category of securities.

(*5*) A national bank or Federal savings association must have policies and procedures that describe how it determines the period of significant financial stress used to calculate the national bank's or Federal savings association's own internal estimates for haircuts under this section and must be able to provide empirical support for the period used. The national bank or Federal savings association must obtain the prior approval of the OCC for, and notify the OCC if the national bank or Federal savings association makes any material changes to, these policies and procedures.

(*6*) Nothing in this section prevents the OCC from requiring a national bank or Federal savings association to use a different period of significant financial stress in the calculation of own internal estimates for haircuts.

(*7*) A national bank or Federal savings association must update its data sets and calculate haircuts no less frequently than quarterly and must also reassess data sets and haircuts whenever market prices change materially.

(B) With respect to debt securities that are investment grade, a national bank or Federal savings association may calculate haircuts for categories of securities. For a category of securities, the national bank or Federal savings association must calculate the haircut on the basis of internal volatility estimates for securities in that category that are representative of the securities in that category that the national bank or Federal savings association has lent, sold subject to repurchase, posted as collateral, borrowed, purchased subject to resale, or taken as collateral. In determining relevant categories, the national bank or Federal savings association must at a minimum take into account:

(*1*) The type of issuer of the security;

(*2*) The credit quality of the security;

(*3*) The maturity of the security; and

(*4*) The interest rate sensitivity of the security.

(C) With respect to debt securities that are not investment grade and equity securities, a national bank or Federal savings association must calculate a separate haircut for each individual security.

(D) Where an exposure or collateral (whether in the form of cash or securities) is denominated in a currency that differs from the settlement currency, the national bank or Federal savings association must calculate a separate currency mismatch haircut for its net position in each mismatched currency based on estimated volatilities of foreign exchange rates between the mismatched currency and the settlement currency.

(E) A national bank's or Federal savings association's own estimates of market price and foreign exchange rate volatilities may not take into account the correlations among securities and

foreign exchange rates on either the exposure or collateral side of a transaction (or netting set) or the correlations among securities and foreign exchange rates between the exposure and collateral sides of the transaction (or netting set).

(3) *Simple VaR methodology*. With the prior written approval of the OCC, a national bank or Federal savings association may estimate EAD for a netting set using a VaR model that meets the requirements in paragraph (b)(3)(iii) of this section. In such event, the national bank or Federal savings association must set EAD equal to max {0, [(ΣE − ΣC) + PFE]}, where:

(i) ΣE equals the value of the exposure (the sum of the current fair values of all instruments, gold, and cash the national bank or Federal savings association has lent, sold subject to repurchase, or posted as collateral to the counterparty under the netting set);

(ii) ΣC equals the value of the collateral (the sum of the current fair values of all instruments, gold, and cash the national bank or Federal savings association has borrowed, purchased subject to resale, or taken as collateral from the counterparty under the netting set); and

(iii) PFE (potential future exposure) equals the national bank's or Federal savings association's empirically based best estimate of the 99th percentile, one-tailed confidence interval for an increase in the value of (ΣE − ΣC) over a five-business-day holding period for repo-style transactions, or over a ten-business-day holding period for eligible margin loans except for netting sets for which paragraph (b)(3)(iv) of this section applies using a minimum one-year historical observation period of price data representing the instruments that the national bank or Federal savings association has lent, sold subject to repurchase, posted as collateral, borrowed, purchased subject to resale, or taken as collateral. The national bank or Federal savings association must validate its VaR model by establishing and maintaining a rigorous and regular backtesting regime.

(iv) If the number of trades in a netting set exceeds 5,000 at any time during a quarter, a national bank or Federal savings association must use a twenty-business-day holding period for the following quarter (except when a national bank or Federal savings association is calculating EAD for a cleared transaction under § 3.133). If a netting set contains one or more trades involving illiquid collateral, a national bank or Federal savings association must use a twenty-business-day holding period. If over the two previous quarters more than two margin disputes on a netting set have occurred that lasted more than the holding period, then the national bank or Federal savings association must set its PFE for that netting set equal to an estimate over a holding period that is at least two times the minimum holding period for that netting set.

(c) *EAD for OTC derivative contracts*—(1) *OTC derivative contracts not subject to a qualifying master netting agreement*. A national bank or Federal savings association must determine the EAD for an OTC derivative contract that is not subject to a qualifying master netting agreement using the current exposure methodology in paragraph (c)(5) of this section or using the internal models methodology described in paragraph (d) of this section.

(2) *OTC derivative contracts subject to a qualifying master netting agreement*. A national bank or Federal savings association must determine the EAD for multiple OTC derivative contracts that are subject to a qualifying master netting agreement using the current exposure methodology in paragraph (c)(6) of this section or using the internal models methodology described in paragraph (d) of this section.

(3) *Credit derivatives*. Notwithstanding paragraphs (c)(1) and (c)(2) of this section:

(i) A national bank or Federal savings association that purchases a credit derivative that is recognized under § 3.134 or § 3.135 as a credit risk mitigant for an exposure that is not a covered position under subpart F of this part is not required to calculate a separate counterparty credit risk capital requirement under this section so long as the national bank or Federal savings association does so consistently for all such credit derivatives and either includes or excludes all such credit derivatives that are subject to a

master netting agreement from any measure used to determine counterparty credit risk exposure to all relevant counterparties for risk-based capital purposes.

(ii) A national bank or Federal savings association that is the protection provider in a credit derivative must treat the credit derivative as a wholesale exposure to the reference obligor and is not required to calculate a counterparty credit risk capital requirement for the credit derivative under this section, so long as it does so consistently for all such credit derivatives and either includes all or excludes all such credit derivatives that are subject to a master netting agreement from any measure used to determine counterparty credit risk exposure to all relevant counterparties for risk-based capital purposes (unless the national bank or Federal savings association is treating the credit derivative as a covered position under subpart F of this part, in which case the national bank or Federal savings association must calculate a supplemental counterparty credit risk capital requirement under this section).

(4) *Equity derivatives.* A national bank or Federal savings association must treat an equity derivative contract as an equity exposure and compute a risk-weighted asset amount for the equity derivative contract under §§ 3.151–3.155 (unless the national bank or Federal savings association is treating the contract as a covered position under subpart F of this part). In addition, if the national bank or Federal savings association is treating the contract as a covered position under subpart F of this part, and under certain other circumstances described in § 3.155, the national bank or Federal savings association must also calculate a risk-based capital requirement for the counterparty credit risk of an equity derivative contract under this section.

(5) *Single OTC derivative contract.* Except as modified by paragraph (c)(7) of this section, the EAD for a single OTC derivative contract that is not subject to a qualifying master netting agreement is equal to the sum of the national bank's or Federal savings association's current credit exposure and potential future credit exposure (PFE) on the derivative contract.

(i) *Current credit exposure.* The current credit exposure for a single OTC derivative contract is the greater of the mark-to-fair value of the derivative contract or zero; and

(ii) *PFE.* The PFE for a single OTC derivative contract, including an OTC derivative contract with a negative mark-to-fair value, is calculated by multiplying the notional principal amount of the derivative contract by the appropriate conversion factor in Table 2 to § 3.132. For purposes of calculating either the PFE under paragraph (c)(5) of this section or the gross PFE under paragraph (c)(6) of this section for exchange rate contracts and other similar contracts in which the notional principal amount is equivalent to the cash flows, the notional principal amount is the net receipts to each party falling due on each value date in each currency. For any OTC derivative contract that does not fall within one of the specified categories in Table 2 to § 3.132, the PFE must be calculated using the ''other'' conversion factors. A national bank or Federal savings association must use an OTC derivative contract's effective notional principal amount (that is, its apparent or stated notional principal amount multiplied by any multiplier in the OTC derivative contract) rather than its apparent or stated notional principal amount in calculating PFE. PFE of the protection provider of a credit derivative is capped at the net present value of the amount of unpaid premiums.

TABLE 2 TO § 3.132—CONVERSION FACTOR MATRIX FOR OTC DERIVATIVE CONTRACTS [1]

Remaining maturity [2]	Interest rate	Foreign exchange rate and gold	Credit (investment-grade reference asset) [3]	Credit (non-investment-grade reference asset)	Equity	Precious metals (except gold)	Other
One year or less	0.00	0.01	0.05	0.10	0.06	0.07	0.10
Over one to five years ..	0.005	0.05	0.05	0.10	0.08	0.07	0.12

TABLE 2 TO § 3.132—CONVERSION FACTOR MATRIX FOR OTC DERIVATIVE CONTRACTS [1]—Continued

Remaining maturity [2]	Interest rate	Foreign exchange rate and gold	Credit (investment-grade reference asset) [3]	Credit (non-investment-grade reference asset)	Equity	Precious metals (except gold)	Other
Over five years	0.015	0.075	0.05	0.10	0.10	0.08	0.15

[1] For an OTC derivative contract with multiple exchanges of principal, the conversion factor is multiplied by the number of remaining payments in the derivative contract.

[2] For an OTC derivative contract that is structured such that on specified dates any outstanding exposure is settled and the terms are reset so that the fair value of the contract is zero, the remaining maturity equals the time until the next reset date. For an interest rate derivative contract with a remaining maturity of greater than one year that meets these criteria, the minimum conversion factor is 0.005.

[3] A national bank or Federal savings association must use the column labeled "Credit (investment-grade reference asset)" for a credit derivative whose reference asset is an outstanding unsecured long-term debt security without credit enhancement that is investment grade. A national bank or Federal savings association must use the column labeled "Credit (non-investment-grade reference asset)" for all other credit derivatives.

(6) *Multiple OTC derivative contracts subject to a qualifying master netting agreement.* Except as modified by paragraph (c)(7) of this section, the EAD for multiple OTC derivative contracts subject to a qualifying master netting agreement is equal to the sum of the net current credit exposure and the adjusted sum of the PFE exposure for all OTC derivative contracts subject to the qualifying master netting agreement.

(i) *Net current credit exposure.* The net current credit exposure is the greater of:

(A) The net sum of all positive and negative fair values of the individual OTC derivative contracts subject to the qualifying master netting agreement; or

(B) Zero; and

(ii) *Adjusted sum of the PFE.* The adjusted sum of the PFE, A_{net}, is calculated as

$$A_{net} = (0.4 \times A_{gross}) + (0.6 \times NGR \times A_{gross}),$$

where:

(A) A_{gross} = the gross PFE (that is, the sum of the PFE amounts (as determined under paragraph (c)(5)(ii) of this section) for each individual derivative contract subject to the qualifying master netting agreement); and

(B) NGR = the net to gross ratio (that is, the ratio of the net current credit exposure to the gross current credit exposure). In calculating the NGR, the gross current credit exposure equals the sum of the positive current credit exposures (as determined under paragraph (c)(6)(i) of this section) of all individual derivative contracts subject to the qualifying master netting agreement.

(7) *Collateralized OTC derivative contracts.* A national bank or Federal savings association may recognize the credit risk mitigation benefits of financial collateral that secures an OTC derivative contract or single-product netting set of OTC derivatives by factoring the collateral into its LGD estimates for the contract or netting set. Alternatively, a national bank or Federal savings association may recognize the credit risk mitigation benefits of financial collateral that secures such a contract or netting set that is marked-to-market on a daily basis and subject to a daily margin maintenance requirement by estimating an unsecured LGD for the contract or netting set and adjusting the EAD calculated under paragraph (c)(5) or (c)(6) of this section using the collateral haircut approach in paragraph (b)(2) of this section. The national bank or Federal savings association must substitute the EAD calculated under paragraph (c)(5) or (c)(6) of this section for ΣE in the equation in paragraph (b)(2)(i) of this section and must use a ten-business day minimum holding period ($T_M = 10$) unless a longer holding period is required by paragraph (b)(2)(iii)(A)(*3*) of this section.

(8) *Clearing member national bank's or Federal savings association's EAD.* A clearing member national bank's or Federal savings association's EAD for an OTC derivative contract or netting set of OTC derivative contracts where the national bank or Federal savings association is either acting as a financial intermediary and enters into an

offsetting transaction with a QCCP or where the national bank or Federal savings association provides a guarantee to the QCCP on the performance of the client equals the exposure amount calculated according to paragraph (c)(5) or (6) of this section multiplied by the scaling factor 0.71. If the national bank or Federal savings association determines that a longer period is appropriate, it must use a larger scaling factor to adjust for a longer holding period as follows:

$$\text{Scaling factor} = \sqrt{\frac{H}{10}}$$

where

H = the holding period greater than five days. Additionally, the OCC may require the national bank or Federal savings association to set a longer holding period if the OCC determines that a longer period is appropriate due to the nature, structure, or characteristics of the transaction or is commensurate with the risks associated with the transaction.

(d) *Internal models methodology.* (1)(i) With prior written approval from the OCC, a national bank or Federal savings association may use the internal models methodology in this paragraph (d) to determine EAD for counterparty credit risk for derivative contracts (collateralized or uncollateralized) and single-product netting sets thereof, for eligible margin loans and single-product netting sets thereof, and for repo-style transactions and single-product netting sets thereof.

(ii) A national bank or Federal savings association that uses the internal models methodology for a particular transaction type (derivative contracts, eligible margin loans, or repo-style transactions) must use the internal models methodology for all transactions of that transaction type. A national bank or Federal savings association may choose to use the internal models methodology for one or two of these three types of exposures and not the other types.

(iii) A national bank or Federal savings association may also use the internal models methodology for derivative contracts, eligible margin loans, and repo-style transactions subject to a qualifying cross-product netting agreement if:

(A) The national bank or Federal savings association effectively integrates the risk mitigating effects of cross-product netting into its risk management and other information technology systems; and

(B) The national bank or Federal savings association obtains the prior written approval of the OCC.

(iv) A national bank or Federal savings association that uses the internal models methodology for a transaction type must receive approval from the OCC to cease using the methodology for that transaction type or to make a material change to its internal model.

(2) *Risk-weighted assets using IMM.* Under the IMM, a national bank or Federal savings association uses an internal model to estimate the expected exposure (EE) for a netting set and then calculates EAD based on that EE. A national bank or Federal savings association must calculate two EEs and two EADs (one stressed and one unstressed) for each netting set as follows:

(i) $EAD_{unstressed}$ is calculated using an EE estimate based on the most recent data meeting the requirements of paragraph (d)(3)(vii) of this section;

(ii) $EAD_{stressed}$ is calculated using an EE estimate based on a historical period that includes a period of stress to the credit default spreads of the national bank's or Federal savings association's counterparties according to paragraph (d)(3)(viii) of this section;

(iii) The national bank or Federal savings association must use its internal model's probability distribution for changes in the fair value of a netting set that are attributable to changes in market variables to determine EE; and

(iv) Under the internal models methodology, EAD = Max (0, α x effective EPE − CVA), or, subject to the prior written approval of OCC as provided in paragraph (d)(10) of this section, a more conservative measure of EAD.

(A) CVA equals the credit valuation adjustment that the national bank or Federal savings association has recognized in its balance sheet valuation of any OTC derivative contracts in the netting set. For purposes of this paragraph (d), CVA does not include any adjustments to common equity tier 1 capital attributable to changes in the fair value of the national bank's or Federal savings association's liabilities that are due to changes in its own credit risk since the inception of the transaction with the counterparty.

(B) $Effective\ EPE_{t_k} = \sum_{k=1}^{n} Effective\ EE_k \times \Delta t_k$

(that is, effective EPE is the time-weighted average of effective EE where the weights are the proportion that an individual effective EE represents in a one-year time interval)

where:

(1) $EffectiveEE_{t_k} = \max\left(EffectiveEE_{t_{k-1}}, EE_{t_k}\right)$ (that is, for a specific date t_k, effective EE is the greater of EE at that date or the effective EE at the previous date); and

(2) t_k represents the k^{th} future time period in the model and there are n time periods represented in the model over the first year, and

(C) α = 1.4 except as provided in paragraph (d)(5) of this section, or when the OCC has determined that the national bank or Federal savings association must set α higher based on the national bank's or Federal savings association's specific characteristics of counterparty credit risk or model performance.

(v) A national bank or Federal savings association may include financial collateral currently posted by the counterparty as collateral (but may not include other forms of collateral) when calculating EE.

(vi) If a national bank or Federal savings association hedges some or all of the counterparty credit risk associated with a netting set using an eligible credit derivative, the national bank or Federal savings association may take the reduction in exposure to the counterparty into account when estimating EE. If the national bank or Federal savings association recognizes this reduction in exposure to the counterparty in its estimate of EE, it must also use its internal model to estimate a separate EAD for the national bank's or Federal savings association's exposure to the protection provider of the credit derivative.

(3) *Prior approval relating to EAD calculation.* To obtain OCC approval to calculate the distributions of exposures upon which the EAD calculation is based, the national bank or Federal savings association must demonstrate to the satisfaction of the OCC that it has been using for at least one year an internal model that broadly meets the following minimum standards, with which the national bank or Federal savings association must maintain compliance:

(i) The model must have the systems capability to estimate the expected exposure to the counterparty on a daily basis (but is not expected to estimate or report expected exposure on a daily basis);

(ii) The model must estimate expected exposure at enough future dates to reflect accurately all the future cash flows of contracts in the netting set;

(iii) The model must account for the possible non-normality of the exposure distribution, where appropriate;

(iv) The national bank or Federal savings association must measure, monitor, and control current counterparty exposure and the exposure to the counterparty over the whole life of all contracts in the netting set;

(v) The national bank or Federal savings association must be able to measure and manage current exposures gross and net of collateral held, where appropriate. The national bank or Federal savings association must estimate expected exposures for OTC derivative contracts both with and without the effect of collateral agreements;

(vi) The national bank or Federal savings association must have procedures to identify, monitor, and control wrong-way risk throughout the life of an exposure. The procedures must include stress testing and scenario analysis;

(vii) The model must use current market data to compute current exposures. The national bank or Federal savings association must estimate model parameters using historical data from the most recent three-year period and update the data quarterly or more frequently if market conditions warrant. The national bank or Federal savings association should consider using model parameters based on forward-looking measures, where appropriate;

(viii) When estimating model parameters based on a stress period, the national bank or Federal savings association must use at least three years of historical data that include a period of stress to the credit default spreads of the national bank's or Federal savings association's counterparties. The national bank or Federal savings association must review the data set and update the data as necessary, particularly for any material changes in its counterparties. The national bank or Federal savings association must demonstrate, at least quarterly, and maintain documentation of such demonstration, that the stress period coincides with increased CDS or other credit spreads of the national bank's or Federal savings association's counterparties. The national bank or Federal savings association must have procedures to evaluate the effectiveness of its stress calibration that include a process for using benchmark portfolios that are vulnerable to the same risk factors as the national bank's or Federal savings association's portfolio. The OCC may require the national bank or Federal savings association to modify its stress calibration to better reflect actual historic losses of the portfolio;

(ix) A national bank or Federal savings association must subject its internal model to an initial validation and annual model review process. The model review should consider whether the inputs and risk factors, as well as the model outputs, are appropriate. As part of the model review process, the national bank or Federal savings association must have a backtesting program for its model that includes a process by which unacceptable model performance will be determined and remedied;

(x) A national bank or Federal savings association must have policies for the measurement, management and control of collateral and margin amounts; and

(xi) A national bank or Federal savings association must have a comprehensive stress testing program that captures all credit exposures to counterparties, and incorporates stress testing of principal market risk factors and creditworthiness of counterparties.

(4) *Calculating the maturity of exposures.* (i) If the remaining maturity of the exposure or the longest-dated contract in the netting set is greater than one year, the national bank or Federal savings association must set M for the exposure or netting set equal to the lower of five years or M(EPE), where:

(A) $$M(EPE) = 1 + \frac{\sum_{t_k > 1\,year}^{maturity} EE_k \times \Delta t_k \times df_k}{\sum_{t_k \le 1\,year} effectiveEE_k \times \Delta t_k \times df_k};$$

(B) df_k is the risk-free discount factor for future time period t_k; and

(C) $\Delta t_k = t_k - t_{k-1}$.

(ii) If the remaining maturity of the exposure or the longest-dated contract in the netting set is one year or less, the national bank or Federal savings association must set M for the exposure or netting set equal to one year, except as provided in § 3.131(d)(7).

(iii) Alternatively, a national bank or Federal savings association that uses an internal model to calculate a one-sided credit valuation adjustment may use the effective credit duration estimated by the model as M(EPE) in place of the formula in paragraph (d)(4)(i) of this section.

(5) *Effects of collateral agreements on EAD.* A national bank or Federal savings association may capture the effect on EAD of a collateral agreement that requires receipt of collateral when exposure to the counterparty increases, but may not capture the effect on EAD of a collateral agreement that requires receipt of collateral when counterparty credit quality deteriorates. Two methods are available to capture the effect of a collateral agreement, as set forth in paragraphs (d)(5)(i) and (ii) of this section:

(i) With prior written approval from the OCC, a national bank or Federal savings association may include the effect of a collateral agreement within its internal model used to calculate EAD. The national bank or Federal savings association may set EAD equal to the expected exposure at the end of the margin period of risk. The margin period of risk means, with respect to a netting set subject to a collateral agreement, the time period from the most recent exchange of collateral with a counterparty until the next required exchange of collateral, plus the period of time required to sell and realize the proceeds of the least liquid collateral that can be delivered under the terms of the collateral agreement and, where applicable, the period of time required to re-hedge the resulting market risk upon the default of the counterparty. The minimum margin period of risk is set according to paragraph (d)(5)(iii) of this section; or

(ii) As an alternative to paragraph (d)(5)(i) of this section, a national bank or Federal savings association that can model EPE without collateral agreements but cannot achieve the higher level of modeling sophistication to model EPE with collateral agreements can set effective EPE for a collateralized netting set equal to the lesser of:

(A) An add-on that reflects the potential increase in exposure of the netting set over the margin period of risk, plus the larger of:

(*1*) The current exposure of the netting set reflecting all collateral held or posted by the national bank or Federal savings association excluding any collateral called or in dispute; or

(*2*) The largest net exposure including all collateral held or posted under the margin agreement that would not trigger a collateral call. For purposes of this section, the add-on is computed as the expected increase in the netting set's exposure over the margin period of risk (set in accordance with paragraph (d)(5)(iii) of this section); or

(B) Effective EPE without a collateral agreement plus any collateral the

national bank or Federal savings association posts to the counterparty that exceeds the required margin amount.

(iii) For purposes of this part, including paragraphs (d)(5)(i) and (ii) of this section, the margin period of risk for a netting set subject to a collateral agreement is:

(A) Five business days for repo-style transactions subject to daily remargining and daily marking-to-market, and ten business days for other transactions when liquid financial collateral is posted under a daily margin maintenance requirement, or

(B) Twenty business days if the number of trades in a netting set exceeds 5,000 at any time during the previous quarter or contains one or more trades involving illiquid collateral or any derivative contract that cannot be easily replaced (except if the national bank or Federal savings association is calculating EAD for a cleared transaction under § 3.133). If over the two previous quarters more than two margin disputes on a netting set have occurred that lasted more than the margin period of risk, then the national bank or Federal savings association must use a margin period of risk for that netting set that is at least two times the minimum margin period of risk for that netting set. If the periodicity of the receipt of collateral is N-days, the minimum margin period of risk is the minimum margin period of risk under this paragraph (d) plus N minus 1. This period should be extended to cover any impediments to prompt re-hedging of any market risk.

(C) Five business days for an OTC derivative contract or netting set of OTC derivative contracts where the national bank or Federal savings association is either acting as a financial intermediary and enters into an offsetting transaction with a CCP or where the national bank or Federal savings association provides a guarantee to the CCP on the performance of the client. A national bank or Federal savings association must use a longer holding period if the national bank or Federal savings association determines that a longer period is appropriate. Additionally, the OCC may require the national bank or Federal savings association to set a longer holding period if the OCC determines that a longer period is appropriate due to the nature, structure, or characteristics of the transaction or is commensurate with the risks associated with the transaction.

(6) *Own estimate of alpha.* With prior written approval of the OCC, a national bank or Federal savings association may calculate alpha as the ratio of economic capital from a full simulation of counterparty exposure across counterparties that incorporates a joint simulation of market and credit risk factors (numerator) and economic capital based on EPE (denominator), subject to a floor of 1.2. For purposes of this calculation, economic capital is the unexpected losses for all counterparty credit risks measured at a 99.9 percent confidence level over a one-year horizon. To receive approval, the national bank or Federal savings association must meet the following minimum standards to the satisfaction of the OCC:

(i) The national bank's or Federal savings association's own estimate of alpha must capture in the numerator the effects of:

(A) The material sources of stochastic dependency of distributions of fair values of transactions or portfolios of transactions across counterparties;

(B) Volatilities and correlations of market risk factors used in the joint simulation, which must be related to the credit risk factor used in the simulation to reflect potential increases in volatility or correlation in an economic downturn, where appropriate; and

(C) The granularity of exposures (that is, the effect of a concentration in the proportion of each counterparty's exposure that is driven by a particular risk factor).

(ii) The national bank or Federal savings association must assess the potential model uncertainty in its estimates of alpha.

(iii) The national bank or Federal savings association must calculate the numerator and denominator of alpha in a consistent fashion with respect to modeling methodology, parameter specifications, and portfolio composition.

(iv) The national bank or Federal savings association must review and

adjust as appropriate its estimates of the numerator and denominator of alpha on at least a quarterly basis and more frequently when the composition of the portfolio varies over time.

(7) *Risk-based capital requirements for transactions with specific wrong-way risk.* A national bank or Federal savings association must determine if a repo-style transaction, eligible margin loan, bond option, or equity derivative contract or purchased credit derivative to which the national bank or Federal savings association applies the internal models methodology under this paragraph (d) has specific wrong-way risk. If a transaction has specific wrong-way risk, the national bank or Federal savings association must treat the transaction as its own netting set and exclude it from the model described in §3.132(d)(2) and instead calculate the risk-based capital requirement for the transaction as follows:

(i) For an equity derivative contract, by multiplying:

(A) K, calculated using the appropriate risk-based capital formula specified in Table 1 of §3.131 using the PD of the counterparty and LGD equal to 100 percent, by

(B) The maximum amount the national bank or Federal savings association could lose on the equity derivative.

(ii) For a purchased credit derivative by multiplying:

(A) K, calculated using the appropriate risk-based capital formula specified in Table 1 of §3.131 using the PD of the counterparty and LGD equal to 100 percent, by

(B) The fair value of the reference asset of the credit derivative.

(iii) For a bond option, by multiplying:

(A) K, calculated using the appropriate risk-based capital formula specified in Table 1 of §3.131 using the PD of the counterparty and LGD equal to 100 percent, by

(B) The smaller of the notional amount of the underlying reference asset and the maximum potential loss under the bond option contract.

(iv) For a repo-style transaction or eligible margin loan by multiplying:

(A) K, calculated using the appropriate risk-based capital formula specified in Table 1 of §3.131 using the PD of the counterparty and LGD equal to 100 percent, by

(B) The EAD of the transaction determined according to the EAD equation in §3.131(b)(2), substituting the estimated value of the collateral assuming a default of the counterparty for the value of the collateral in Σc of the equation.

(8) *Risk-weighted asset amount for IMM exposures with specific wrong-way risk.* The aggregate risk-weighted asset amount for IMM exposures with specific wrong-way risk is the sum of a national bank's or Federal savings association's risk-based capital requirement for purchased credit derivatives that are not bond options with specific wrong-way risk as calculated under paragraph (d)(7)(ii) of this section, a national bank's or Federal savings association's risk-based capital requirement for equity derivatives with specific wrong-way risk as calculated under paragraph (d)(7)(i) of this section, a national bank's or Federal savings association's risk-based capital requirement for bond options with specific wrong-way risk as calculated under paragraph (d)(7)(iii) of this section, and a national bank's or Federal savings association's risk-based capital requirement for repo-style transactions and eligible margin loans with specific wrong-way risk as calculated under paragraph (d)(7)(iv) of this section, multiplied by 12.5.

(9) *Risk-weighted assets for IMM exposures.* (i) The national bank or Federal savings association must insert the assigned risk parameters for each counterparty and netting set into the appropriate formula specified in Table 1 of §3.131 and multiply the output of the formula by the $EAD_{unstressed}$ of the netting set to obtain the unstressed capital requirement for each netting set. A national bank or Federal savings association that uses an advanced CVA approach that captures migrations in credit spreads under paragraph (e)(3) of this section must set the maturity adjustment (b) in the formula equal to zero. The sum of the unstressed capital requirement calculated for each netting set equals $K_{unstressed}$.

(ii) The national bank or Federal savings association must insert the assigned risk parameters for each wholesale obligor and netting set into the appropriate formula specified in Table 1 of §3.131 and multiply the output of the formula by the $EAD_{stressed}$ of the netting set to obtain the stressed capital requirement for each netting set. A national bank or Federal savings association that uses an advanced CVA approach that captures migrations in credit spreads under paragraph (e)(3) of this section must set the maturity adjustment (b) in the formula equal to zero. The sum of the stressed capital requirement calculated for each netting set equals $K_{stressed}$.

(iii) The national bank's or Federal savings association's dollar risk-based capital requirement under the internal models methodology equals the larger of $K_{unstressed}$ and $K_{stressed}$. A national bank's or Federal savings association's risk-weighted assets amount for IMM exposures is equal to the capital requirement multiplied by 12.5, plus risk-weighted assets for IMM exposures with specific wrong-way risk in paragraph (d)(8) of this section and those in paragraph (d)(10) of this section.

(10) *Other measures of counterparty exposure.* (i) With prior written approval of the OCC, a national bank or Federal savings association may set EAD equal to a measure of counterparty credit risk exposure, such as peak EAD, that is more conservative than an alpha of 1.4 (or higher under the terms of paragraph (d)(7)(iv)(C) of this section) times the larger of $EPE_{unstressed}$ and $EPE_{stressed}$ for every counterparty whose EAD will be measured under the alternative measure of counterparty exposure. The national bank or Federal savings association must demonstrate the conservatism of the measure of counterparty credit risk exposure used for EAD. With respect to paragraph (d)(10)(i) of this section:

(A) For material portfolios of new OTC derivative products, the national bank or Federal savings association may assume that the current exposure methodology in paragraphs (c)(5) and (c)(6) of this section meets the conservatism requirement of this section for a period not to exceed 180 days.

(B) For immaterial portfolios of OTC derivative contracts, the national bank or Federal savings association generally may assume that the current exposure methodology in paragraphs (c)(5) and (c)(6) of this section meets the conservatism requirement of this section.

(ii) To calculate risk-weighted assets for purposes of the approach in paragraph (d)(10)(i) of this section, the national bank or Federal savings association must insert the assigned risk parameters for each counterparty and netting set into the appropriate formula specified in Table 1 of §3.131, multiply the output of the formula by the EAD for the exposure as specified above, and multiply by 12.5.

(e) *Credit valuation adjustment (CVA) risk-weighted assets*—(1) *In general.* With respect to its OTC derivative contracts, a national bank or Federal savings association must calculate a CVA risk-weighted asset amount for its portfolio of OTC derivative transactions that are subject to the CVA capital requirement using the simple CVA approach described in paragraph (e)(5) of this section or, with prior written approval of the OCC, the advanced CVA approach described in paragraph (e)(6) of this section. A national bank or Federal savings association that receives prior OCC approval to calculate its CVA risk-weighted asset amounts for a class of counterparties using the advanced CVA approach must continue to use that approach for that class of counterparties until it notifies the OCC in writing that the national bank or Federal savings association expects to begin calculating its CVA risk-weighted asset amount using the simple CVA approach. Such notice must include an explanation of the national bank's or Federal savings association's rationale and the date upon which the national bank or Federal savings association will begin to calculate its CVA risk-weighted asset amount using the simple CVA approach.

(2) *Market risk national banks or Federal savings associations.* Notwithstanding the prior approval requirement in paragraph (e)(1) of this section, a market risk national bank or Federal savings association may calculate its CVA risk-weighted asset amount using

the advanced CVA approach if the national bank or Federal savings association has OCC approval to:

(i) Determine EAD for OTC derivative contracts using the internal models methodology described in paragraph (d) of this section; and

(ii) Determine its specific risk add-on for debt positions issued by the counterparty using a specific risk model described in § 3.207(b).

(3) *Recognition of hedges.* (i) A national bank or Federal savings association may recognize a single name CDS, single name contingent CDS, any other equivalent hedging instrument that references the counterparty directly, and index credit default swaps (CDS_{ind}) as a CVA hedge under paragraph (e)(5)(ii) of this section or paragraph (e)(6) of this section, provided that the position is managed as a CVA hedge in accordance with the national bank's or Federal savings association's hedging policies.

(ii) A national bank or Federal savings association shall not recognize as a CVA hedge any tranched or n^{th}-to-default credit derivative.

(4) *Total CVA risk-weighted assets.* Total CVA risk-weighted assets is the CVA capital requirement, $K_{CVA,}$ calculated for a national bank's or Federal savings association's entire portfolio of OTC derivative counterparties that are subject to the CVA capital requirement, multiplied by 12.5.

(5) *Simple CVA approach.* (i) Under the simple CVA approach, the CVA capital requirement, K_{CVA}, is calculated according to the following formula:

$$K_{CVA} = 2.33 \times \sqrt{\left(\sum_i 0.5 \times w_i \times \left(M_i \times EAD_i^{total} - M_i^{hedge} \times B_i \right) - \sum_{ind} w_{ind} \times M_{ind} \times B_{ind} \right)^2 + A}$$

Where:

$$A = \sum_i 0.75 \times w_i^2 \times \left(M_i \times EAD_i^{total} - M_i^{hedge} \times B_i \right)^2$$

(A) w_i = the weight applicable to counterparty i under Table 3 to § 3.132;

(B) M_i = the EAD-weighted average of the effective maturity of each netting set with counterparty i (where each netting set's effective maturity can be no less than one year.)

(C) EAD_i^{total} = the sum of the EAD for all netting sets of OTC derivative contracts with counterparty i calculated using the current exposure methodology described in paragraph (c) of this section or the internal models methodology described in paragraph (d) of this section. When the national bank or Federal savings association calculates EAD under paragraph (c) of this section, such EAD may be adjusted for purposes of calculating EAD_i^{total} by multiplying EAD by $(1\text{-}\exp(-0.05 \times M_i))/(0.05 \times M_i)$, where ''exp'' is the exponential function. When the national bank or Federal savings association calculates EAD under paragraph (d) of this section, EAD_i^{total} equals $EAD_{unstressed}$.

(D) M_i^{hedge} = the notional weighted average maturity of the hedge instrument.

(E) B_i = the sum of the notional amounts of any purchased single name CDS referencing counterparty i that is used to hedge CVA risk to counterparty i multiplied by $(1\text{-}\exp(-0.05 \times M_i^{hedge}))/(0.05 \times M_i^{hedge})$.

(F) M_{ind} = the maturity of the CDS_{ind} or the notional weighted average maturity of any CDS_{ind} purchased to hedge CVA risk of counterparty i.

(G) B_{ind} = the notional amount of one or more CDS_{ind} purchased to hedge CVA risk for counterparty i multiplied by $(1\text{-}\exp(-0.05 \times M_{ind}))/(0.05 \times M_{ind})$

(H) w_{ind} = the weight applicable to the CDS_{ind} based on the average weight of the underlying reference names that comprise the index under Table 3 to § 3.132.

(ii) The national bank or Federal savings association may treat the notional amount of the index attributable to a

counterparty as a single name hedge of counterparty i (B_i) when calculating K_{CVA}, and subtract the notional amount of B_i from the notional amount of the CDS_{ind}. A national bank or Federal savings association must treat the CDS_{ind} hedge with the notional amount reduced by B_i as a CVA hedge.

TABLE 3 TO § 3.132—ASSIGNMENT OF COUNTERPARTY WEIGHT

Internal PD (in percent)	Weight w_i (in percent)
0.00–0.07	0.70
>0.070–0.15	0.80
>0.15–0.40	1.00
>0.40–2.00	2.00
>2.00–6.00	3.00
>6.00	10.00

(6) *Advanced CVA approach.* (i) A national bank or Federal savings association may use the VaR model that it uses to determine specific risk under § 3.207(b) or another VaR model that meets the quantitative requirements of § 3.205(b) and § 3.207(b)(1) to calculate its CVA capital requirement for a counterparty by modeling the impact of changes in the counterparties' credit spreads, together with any recognized CVA hedges, on the CVA for the counterparties, subject to the following requirements:

(A) The VaR model must incorporate only changes in the counterparties' credit spreads, not changes in other risk factors. The VaR model does not need to capture jump-to-default risk;

(B) A national bank or Federal savings association that qualifies to use the advanced CVA approach must include in that approach any immaterial OTC derivative portfolios for which it uses the current exposure methodology in paragraph (c) of this section according to paragraph (e)(6)(viii) of this section; and

(C) A national bank or Federal savings association must have the systems capability to calculate the CVA capital requirement for a counterparty on a daily basis (but is not required to calculate the CVA capital requirement on a daily basis).

(ii) Under the advanced CVA approach, the CVA capital requirement, K_{CVA}, is calculated according to the following formulas:

$$K_{CVA} = 3 \times \left(VaR^{CVA}_{Unstressed} + VaR^{CVA}_{Stressed}\right)$$

where VaR^{CVA}_{j} is the 99% VaR reflecting changes of CVA_j and fair value of eligible hedges (aggregated across all counterparties and eligible hedges) resulting from simulated changes of credit spreads over a 10-day time horizon. CVA_j for a given counterparty must be calculated according to

$$CVA_j = \left(LGD_{MKT}\right) \times \sum_{i=1}^{T} Max\left(0; \exp\left(-\frac{s_{i-1} \times t_{i-1}}{LGD_{MKT}}\right) - \exp\left(-\frac{s_i \times t_i}{LGD_{MKT}}\right)\right) \times \left(\frac{EE_{i-1} \times D_{i-1} + EE_i \times D_i}{2}\right)$$

Where

(A) t_i = the time of the i-th revaluation time bucket starting from $t_0 = 0$.

(B) t_T = the longest contractual maturity across the OTC derivative contracts with the counterparty.

(C) s_i = the CDS spread for the counterparty at tenor t_i used to calculate the CVA for the counterparty. If a CDS spread is not available, the national bank or Federal savings association must use a proxy spread based on the credit quality, industry and region of the counterparty.

(D) LGD_{MKT} = the loss given default of the counterparty based on the spread of a publicly traded debt instrument of the counterparty, or, where a publicly

traded debt instrument spread is not available, a proxy spread based on the credit quality, industry, and region of the counterparty. Where no market information and no reliable proxy based on the credit quality, industry, and region of the counterparty are available to determine $LGD_{MKT,}$ a national bank or Federal savings association may use a conservative estimate when determining LGD_{MKT}, subject to approval by the OCC.

(E) EE_i = the sum of the expected exposures for all netting sets with the counterparty at revaluation time t_i, calculated according to paragraphs (e)(6)(iv)(A) and (e)(6)(v)(A) of this section.

(F) D_i = the risk-free discount factor at time $t_{i,}$ where $D_0 = 1$.

(G) Exp is the exponential function.

(H) The subscript j refers either to a stressed or an unstressed calibration as described in paragraphs (e)(6)(iv) and (v) of this section.

(iii) Notwithstanding paragraphs (e)(6)(i) and (e)(6)(ii) of this section, a national bank or Federal savings association must use the formulas in paragraphs (e)(6)(iii)(A) or (e)(6)(iii)(B) of this section to calculate credit spread sensitivities if its VaR model is not based on full repricing.

(A) If the VaR model is based on credit spread sensitivities for specific tenors, the national bank or Federal savings association must calculate each credit spread sensitivity according to the following formula:

Regulatory CS01 =

$$0.0001 \times t_i \times exp\left(-\frac{s_i \times t_i}{LGD_{MKT}}\right) \times \left(\frac{EE_{i-1} \times D_{i-1} - EE_{i+1} \times D_{i+1}}{2}\right)$$

For the final time bucket i = T, the corresponding formula is

Regulatory CS01 =

$$0.0001 \times t_i \times \exp\left(-\frac{s_i \times t_i}{LGD_{MKT}}\right) \times \left(\frac{EE_{i-1} \times D_{i-1} + EE_T \times D_T}{2}\right)$$

(B) If the VaR model uses credit spread sensitivities to parallel shifts in credit spreads,

the [BANK] must calculate each credit spread sensitivity according to the following formula:

Regulatory CS01 =

$$0.0001 \times \sum_{i=1}^{T}\left(t_i \times \exp\left(-\frac{s_i \times t_i}{LGD_{MKT}}\right) - t_{i-1} \times \exp\left(-\frac{s_{i-1} \times t_{i-1}}{LGD_{MKT}}\right)\right) \times \left(\frac{EE_{i-1} \times D_{i-1} + EE_i \times D_i}{2}\right)$$

(iv) To calculate the $CVA_{\text{Unstressed}}$ measure for purposes of paragraph (e)(6)(ii) of this section, the national bank or Federal savings association must:

(A) Use the EE_{i} calculated using the calibration of paragraph (d)(3)(vii) of this section, except as provided in § 3.132(e)(6)(vi), and

(B) Use the historical observation period required under § 3.205(b)(2).

(v) To calculate the CVA_{Stressed} measure for purposes of paragraph (e)(6)(ii) of this section, the national bank or Federal savings association must:

(A) Use the EE_{i} calculated using the stress calibration in paragraph (d)(3)(viii) of this section except as provided in paragraph (e)(6)(vi) of this section.

(B) Calibrate VaR model inputs to historical data from the most severe twelve-month stress period contained within the three-year stress period

used to calculate EE_i. The OCC may require a national bank or Federal savings association to use a different period of significant financial stress in the calculation of the $CVA_{Stressed}$ measure.

(vi) If a national bank or Federal savings association captures the effect of a collateral agreement on EAD using the method described in paragraph (d)(5)(ii) of this section, for purposes of paragraph (e)(6)(ii) of this section, the national bank or Federal savings association must calculate EE_i using the method in paragraph (d)(5)(ii) of this section and keep that EE constant with the maturity equal to the maximum of:

(A) Half of the longest maturity of a transaction in the netting set, and

(B) The notional weighted average maturity of all transactions in the netting set.

(vii) For purposes of paragraph (e)(6) of this section, the national bank's or Federal savings association's VaR model must capture the basis between the spreads of any CDS_{ind} that is used as the hedging instrument and the hedged counterparty exposure over various time periods, including benign and stressed environments. If the VaR model does not capture that basis, the national bank or Federal savings association must reflect only 50 percent of the notional amount of the CDS_{ind} hedge in the VaR model.

(viii) If a national bank or Federal savings association uses the current exposure methodology described in paragraphs (c)(5) and (c)(6) of this section to calculate the EAD for any immaterial portfolios of OTC derivative contracts, the national bank or Federal savings association must use that EAD as a constant EE in the formula for the calculation of CVA with the maturity equal to the maximum of:

(A) Half of the longest maturity of a transaction in the netting set, and

(B) The notional weighted average maturity of all transactions in the netting set.

§ 3.133 Cleared transactions.

(a) *General requirements.* (1) A national bank or Federal savings association that is a clearing member client must use the methodologies described in paragraph (b) of this section to calculate risk-weighted assets for a cleared transaction.

(2) A national bank or Federal savings association that is a clearing member must use the methodologies described in paragraph (c) of this section to calculate its risk-weighted assets for cleared transactions and paragraph (d) of this section to calculate its risk-weighted assets for its default fund contribution to a CCP.

(b) *Clearing member client national banks or Federal savings associations*—(1) *Risk-weighted assets for cleared transactions.* (i) To determine the risk-weighted asset amount for a cleared transaction, a national bank or Federal savings association that is a clearing member client must multiply the trade exposure amount for the cleared transaction, calculated in accordance with paragraph (b)(2) of this section, by the risk weight appropriate for the cleared transaction, determined in accordance with paragraph (b)(3) of this section.

(ii) A clearing member client national bank's or Federal savings association's total risk-weighted assets for cleared transactions is the sum of the risk-weighted asset amounts for all of its cleared transactions.

(2) *Trade exposure amount.* (i) For a cleared transaction that is a derivative contract or a netting set of derivative contracts, trade exposure amount equals the EAD for the derivative contract or netting set of derivative contracts calculated using the methodology used to calculate EAD for OTC derivative contracts set forth in § 3.132(c) or (d), plus the fair value of the collateral posted by the clearing member client national bank or Federal savings association and held by the CCP or a clearing member in a manner that is not bankruptcy remote. When the national bank or Federal savings association calculates EAD for the cleared transaction using the methodology in § 3.132(d), EAD equals $EAD_{unstressed}$.

(ii) For a cleared transaction that is a repo-style transaction or netting set of repo-style transactions, trade exposure amount equals the EAD for the repo-style transaction calculated using the methodology set forth in § 3.132(b)(2), (b)(3), or (d), plus the fair