

Credit Valuation Adjustment

An overview of the standardized method



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1 Definitions

Credit Risk

The risk that a counterparty will fail to discharge a particular obligation (IFRS 7 Financial Instruments: Disclosures).

Counterparty Credit Risk

The risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. This is used to calculate the exposure value and capital requirement for derivative instruments. (CRR IV Article 272 (1))

Fair Value

The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (IFRS 13 Fair Value Measurement).

Credit Valuation Adjustment

'Credit Valuation Adjustment' or 'CVA' means an adjustment to the mid-market valuation of the portfolio of transactions with a counterparty. That adjustment reflects the current market value of the credit risk of the counterparty to the institution. The adjustment does not reflect the current market value of the credit risk of the institution to the counterparty (also known as Debit Valuation Adjustment –DVA). (CRR IV - Article 381)

The fair-value pricing of an OTC derivative depends on market variables (i.e., interest rates, exchange rates, etc.) and the creditworthiness of the counterparties entering into the contract, as well as the valuation methodologies used by counterparties. In this context, a credit valuation adjustment (CVA) is typically defined as the difference between the value of a derivative assuming the counterparty is default-risk free and the value reflecting default risk of the counterparty. (BCBS 214)

2 Introduction

For Over –the- Counter (OTC) derivatives, in addition to the default risk capital requirements for counterparty credit risk, firms must calculate an additional capital charge to cover the risk of mark-to-market losses associated with deterioration in the creditworthiness of the counterparty. As the counterparty's financial position worsens, the market value of its derivatives obligation declines, even though there might not be an actual default. During the financial crisis the CVA risk was a greater source of losses than those arising from outright defaults.

The CVA is the difference between the risk-free value of a portfolio of trades and the market value which takes into account the counterparty's risk of default. The CVA therefore represents an estimate of the adjustment to fair value that a market participant would make to incorporate the credit risk of the counterparty due to any failure to perform on contractual agreements.

3 Instruments for which CVA is applicable

A firm should calculate CVA for all its OTC derivative instruments, other than the credit derivatives recognised to reduce risk-weighted exposure amounts for credit risk

4 Exemptions

The following transactions are excluded from the own funds requirements for CVA risk:-

- Transactions with a Qualifying Central Clearing Counterparty (QCCP) and a client's transaction with a clearing member, when the clearing member acts as an intermediary between the client and a QCCP.
- Transactions with non-financial counterparties, which are established in EU, or non-financial counterparties established in a third country, where the transactions do not exceed the following clearing thresholds:-
 - a) OTC credit derivative threshold (EUR 1 billion in gross notional value)
 - b) OTC equity derivative threshold (EUR 1 billion in gross notional value)
 - c) OTC interest rate derivative threshold (EUR 3 billion in gross notional value)
 - d) OTC foreign exchange derivative threshold (EUR 3 billion in gross notional value)
 - e) OTC commodity derivative and other OTC derivatives (not defined under points (a) to (d)) threshold (EUR 3 billion in gross notional value)
- Intragroup transactions entered into with another counterparty which is part of the same group provided that both counterparties are included in the same consolidation on a full basis and they are subject to an appropriate centralised risk evaluation, measurement and control procedures and that counterparty is established in the Union or, if it is established in a third country, the Commission has adopted an implementing act in respect of that third country as equivalent to that in the Union.
- Transactions with pension scheme arrangements
- Transactions with European System of Central Bank (ESCB) or other member state bodies performing similar functions, the Bank of International Settlements (BIS), Multilateral development banks, Public Sector Enterprises (PSEs), European Financial Stability Facility (EFSF) and European Stability Mechanism (ESM).

5 Standardised method to calculate the CVA

A firm should calculate the own funds requirements for CVA risk for each counterparty in accordance with the following formula:-

$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left(\sum_i 0.5 \cdot w_i \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i \right) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind} \right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i \right)^2}$$

where:

h = the one-year risk horizon (in units of a year); $h = 1$;

w_i = the weight applicable to counterparty "i".

Counterparty "i" shall be mapped to one of the six weights w_i based on an external credit assessment by a nominated ECAI, as set out in Table 1. For a counterparty for which a credit assessment by a nominated ECAI is not available, an institution using the Standardised approach shall assign $w_i=1.0$ % to this counterparty. However, if an institution uses Article 128 (Items associated with High Risk) to risk weight counterparty credit risk exposures to this counterparty, $w_i=3.0$ % shall be assigned.

EAD_i^{total} = the total counterparty credit risk exposure value of counterparty "i" (summed across its netting sets) including the effect of collateral in accordance with the methods set out in Sections 3 to 6 of Title II, Chapter 6 as applicable to the calculation of the own funds requirements for counterparty credit risk for that counterparty. An institution using one of the methods set out in Sections 3 (MtM method) and 4 (Original exposure method) of Title II, Chapter 6 (CCR), may use as EAD_i^{total} the fully adjusted exposure value in accordance with Article 223(5) (E*).

B_i = the notional of purchased single name credit default swap hedges (summed if more than one position) referencing counterparty "i" and used to hedge CVA risk.

That notional amount shall be discounted by applying the following factor:

$$\frac{1 - e^{-0:05 * M_i^{hedge}}}{0:05 * M_i^{hedge}}$$

B_{ind} = is the full notional of one or more index credit default swap of purchased protection used to hedge CVA risk.

That notional amount shall be discounted by applying the following factor:

$$\frac{1 - e^{-0:05 * M_{ind}}}{0:05 * M_{ind}}$$

w_{ind} = is the weight applicable to index hedges. An institution shall determine w_{ind} by calculating a weighted average of w_i that is applicable to the individual constituents of the index.

M_i = the effective maturity of the transactions with counterparty i . For firms not using the IRB approach, M_i is the notional weighted average remaining maturity and should at least be 1 year (based on Article 162 (2) (a) and b).

M_i^{hedge} = the maturity of the hedge instrument with notional B_i (the quantities $M_i^{hedge} B_i$ are to be summed if these are several positions).

M_{ind} = the maturity of the index hedge. In the case of more than one index hedge position, M_{ind} is the notional-weighted maturity.

Table 1 -The weight applicable to counterparty

Credit quality step	Weight W_i
1	0.7%
2	0.8%
3	1.0%
4	2.0%
5	3.0%
6	10.0%

Table 2 - Exposure at default calculation for MtM CCR method – Article 274

Residual Maturity	Interest-rate contracts	Contracts concerning foreign currency rates and gold	Contracts concerning equities	Contracts concerning precious metals except gold	Contracts concerning commodities other than precious metals
One year or less	0%	1%	6%	7%	10%
Over one year, not exceeding five years	0.5%	5%	8%	7%	12%
Over five years	1.5%	7.5%	10%	8%	15%

6 Eligible hedges

Hedges shall be 'eligible hedges' for the purposes of the calculation of own funds requirements for CVA risk only where they are used for the purpose of mitigating CVA risk and managed as such, and are one of the following:

- (a) single-name credit default swaps or other equivalent hedging instruments referencing the counterparty directly
- (b) index credit default swaps, provided that the basis between any individual counterparty spread and the spreads of index credit default swap hedges is reflected, to the satisfaction of the competent authority, in the Value-at-Risk.

7 CVA calculation: an example

Bank X enters into a FX forward deal (Buy £1 million and sell \$1.6 million) to hedge its currency risk with another Bank Y, which has a credit rating of A+ (credit quality step 2), for a term of 3 months. The Bank X has not purchased any credit default swaps that can be used as a hedge.

Step 1: Evaluate the Exposure at Default (EAD) based on table 2 (assuming Bank X uses the MtM method for CCR)

Exposure at Default = EAD = £ 1 million x 1% = £10,000

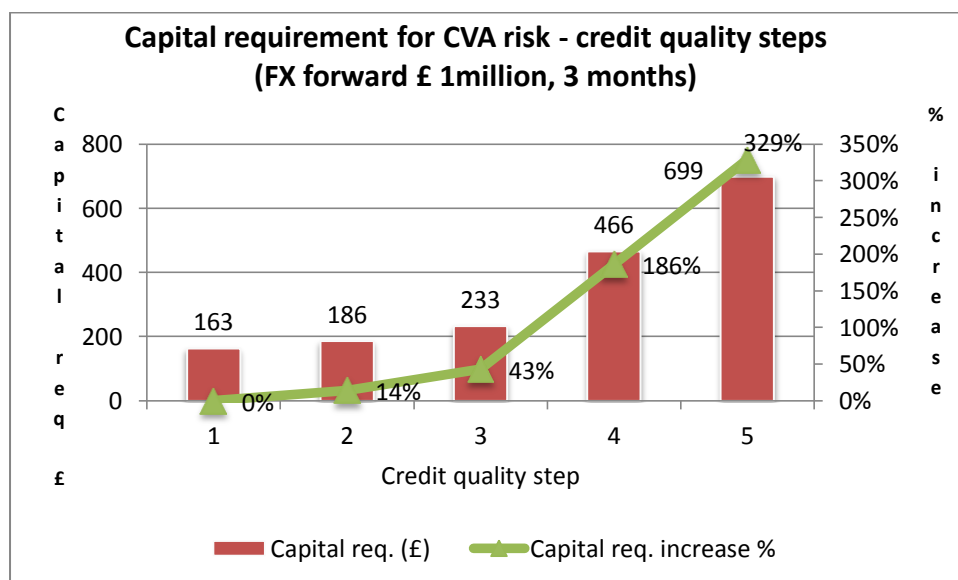
Step 2: Identify the value for the other variables

$h=1$, $w_i = 0.8\%$ (from Table 1) and $M_i = \text{Max}(0.25, 1) = 1$ ¹

Step 3: Apply these values to the formula to calculate the own funds requirement for CVA

K (Capital requirement for CVA risk) = £186.4

The credit quality step plays a very significant role in determining the capital requirement for CVA risk. For the above example, the capital requirement for CVA risk, based on the different credit quality steps is shown below.



*Please note that capital requirement and own funds requirement are the same and are used interchangeably in this article.

¹ The value of M should at least be 1, and the notional amount of each exposure shall be used for weighing the maturity in case of multiple contracts/cash-flows.

8 Katalysys contact information

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