DEMISTIFYING DERIVATIVES

A COMMERCIAL & ACCOUNTING PERSPECTIVE

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Introduction: Demistifying Derivatives

Heightened market volatility, a sharp rise in global interest rates and increased flexibility for restructuring derivatives has reignited queries from our clients about derivative valuations and restructuring or unwind costs. Large swings in the value of derivative portfolios have put ever more scrutiny on accounting valuations and how these are presented in accounts.

In this refresh of the original 2017 white paper, we take a refreshed look at derivative valuations:

1. Mark-to-Market of a derivative or 'mid MtM', represents the Net Present Value of all future projected cashflows to be received and paid, discounted at a risk-free rate (SONIA, SOFR, €STR). This is valued on the same basis as that typically received in valuation reports from banks and is still often used for accounting purposes.

2. Transaction value of a derivative is the 'Mark-to-Market' taking into account credit, bank funding, regulatory capital implications as well as trading costs. It may also factor in the bank's (or corporate's) wider derivative portfolio, wider strategy, and commercial considerations. These factors may impact a derivative valuation when unwinding or restructuring a derivative prior to maturity.

3. Accounting value of a derivative can be the same as the 'Mark-to-Market' described previously, but increasingly often takes into account certain accounting valuation adjustments that depend on the relevant accounting standard. 10 years on from its implementation, IFRS13 puts a greater emphasis on credit valuation adjustments to the 'Mark-to-Market' for accounting purposes which mirror a transaction value. In some cases a funding valuation adjustment is required too.





Derivative 'Mark-to-Market'

The 'Mark-to-Market' (MtM) is an important concept for a corporate that enters into a derivative transaction. For a vanilla uncollateralised interest rate swap, it represents the net present value of the future cashflows (both fixed and floating legs) using current forward market rates. It is also referred to as the 'mid-MtM' value as it is typically calculated using mid-market data and does not include any other adjustments.

The discount rate used to value the future cashflows in GBP is SONIA (Sterling Overnight Index Average). Sterling LIBOR was discontinued on 1st January 2022 and replaced by SONIA as the market standard risk-free rate, at time of writing USD LIBOR and other LIBORS are in the process of being transitioned.

The 'mid-MtM' is also typically reported through monthly valuations reports which is sent by the bank's internal valuations team. This is separate from and may be different to how a bank's client facing derivatives desk may value the transaction.



Derivative transaction valuation

The transaction value of a derivative may be different to the 'mid-MtM' – i.e. when a bank executes a new client hedge, or in the event of early termination or restructuring of an existing hedge. The bank may take into account the trading costs of entering into or exiting market hedges, and may charge for the following adjustments for the derivative, or 'XVA's:

1. Credit Reserves (CVA), to reserve against a possible default by the counterparty before maturity of the derivative. Some banks will also consider their own default risk (DVA). The reserve of this from counterparty perspective is also covered in accounting valuations.

2. Funding (FVA), the cost of funding the cash posted in the future for the 'market hedge' - the collateralized market hedge is an opposite market position taken that would neutralize the risk on the counterparty hedge, to mitigate the interest rate risk generated for the bank. The market hedge will typically face clearing houses or interbank desks, where changes in MtM are subject to cash collateralization and additional margining requirements.

3. Capital, or return on capital - a risk weighed return required for bank shareholders depending on the amount of regulatory capital the bank holds against the position.



The costs of adjustments are considered by the bank when entering into a new corporate hedge, restructuring an existing one, or upon early termination of the swap before maturity.

Typically when a new hedge is put into place, costs are summarized as an execution charge for putting on the market hedge, and a credit charge for credit, funding and capital costs. Upon a restructuring of the position such as early termination, this may entail releases (or costs) to the bank, for credit risk, funding and capital – albeit these will likely have changed since the swap was originally executed, due to market movements.

Releases or costs may occasionally be passed to the client's benefit, most commonly for these reasons:

1. Portfolio effects: banks may take into account the impact of other client derivatives in the bank's portfolio. For example, existing cross currency swaps may allow for more efficient pricing of new interest rate or inflation hedging, if there are XVA offsets.

2. Commercial considerations: consideration of future ancillary opportunities with the client, whether there is other bank lending relationship where returns need to be generated

3. Bank strategic direction: whether they want to expand certain sectors, regions or exit certain product lines.

If a counterparty terminates a derivative prior to final maturity, the amount it pays to the bank (or receives) will be a function of the MtM, and may also take into account trading charges and adjustments described previously. Each bank may provide different treatment depending on the way it manages credit risk, its cost of funding/capital, regulatory regime, portfolio impact, commercial and strategic direction.

Sustainability-Linked Derivatives

A product growing in popularity are sustainability linked or ESG linked derivatives. These are primarily interest rate swaps that embed KPIs monitoring corporate compliance with ESG targets, typically into swap confirmations or under separate agreements.

Often sustainability-linked swap metrics are aligned with other financing a corporate puts in place, such as sustainability linked loans.

When sustainability metrics are met the cash flows on the swap are adjusted. This is usually via a spread adjustment on payment dates, such that when metrics are met the payment spread is negative or zero.



Sustainability linked swaps can provide a helpful incentive for clients to meet their sustainability targets, particularly when aligned with sustainability linked financing.



Accounting valuation of a derivative

The value of a derivative for a corporate's accounting purpose is typically the same as the 'mid-MtM' described previously. However, IFRS 13 'Fair Value Measurement' (which was effective from 1 January 2013) looks to address 'non-performance risk' (the likelihood of an obligation not being fulfilled) and in general other factors that would impact the MtM amount upon closing out the derivative position. This places greater emphasis particularly on credit adjustments to the MtM for accounting purposes.

These adjustments mirror some of the concepts described in Section 3, Fair Value from a bank's perspective, and primarily are:

1. Credit Valuation Adjustment (CVA): the impact of the bank credit risk to its counterpart. Note that this is in the other direction from CVA from the bank's perspective.

2. Debit Valuation Adjustment (DVA): the impact of its counterparty credit risk to the bank.

3. Funding Valuation Adjustment (FVA): derivative obligations will normally have a funding impact to the firm entering these which can be estimated own credit spreads and bank CDS or bonds.



CVA is a valuation adjustment that factors in the bank's credit risk and results in a negative fair value impact, in doing so reducing a MtM asset.

DVA, considering the corporate's own credit risk, is applied as a positive adjustment to reduce a MtM liability. Some people find the concept counterintuitive, especially as the movement in DVA often offsets movements in the value of the derivative, so that when the value of the derivative decreases there's an increase of the DVA through the financial statements.

There are, however, some strong arguments for DVA to be included in the derivatives fair value:

1. DVA is necessary in order to get an equal view of the derivative from both counterparty's point of view and so arrive at a single mid-market price for the derivative, from which the pre-CVA/DVA value is normally derived.

2. DVA has always been included when pricing a bond and so this can be viewed as an extension to derivatives.

To accurately estimate risk of derivative exposures, paths of potential future exposures (MtM) are simulated based on market implied forward rates and volatilities. For the interest rate swap example, this means CVA and DVA can simultaneously be calculated (bilateral-CVA) which captures the risk of the swap being in-the-money and the bank defaulting (CVA), as well as the risk of the swap being out-the-money and the corporate defaulting (DVA). Such models are often complex and computationally intensive often requiring sophisticated Treasury Management systems (TMS) to calculate.



Example Monte Carlo simulation of different paths for derivative portfolio values:

Constiuents for calculating CVA/DVA (BVA) and FVA

CVA + DVA = BVA (bilateral credit valuation adjustment):



Depending on (i) the size of the derivative exposure, (ii) the types of exposures (iii) the materiality of estimated CVA adjustments and (iv) the corporate's ability to access these valuations - considerations can be made for less sophisticated valuation adjustments or, in some cases, not to apply them at all.

FVA (Funding Valuation Adjustments) for corporates is still debated in the market and remains a topic for dispute between auditors. It is often most appropriate for derivatives with back-ended cashflows (inflation swaps, cross-currency swaps, etc.).

Derivative obligations will normally have a funding impact on a firm, which comes as either a benefit (FBA) or a cost (FCA). FVA aims to capture this impact but arriving at a suitable funding spread (absent of credit, liquidity or other premiums) is often the most challenging element. Once a funding spread has been assumed, the calculation of FVA isn't dissimilar to CVA and DVA.

The sum of all valuation adjustments is often to referred to as XVA. Banks may also apply KVA (capital), MVA (margin) and ColVA (collateral) valuation adjustments, however for most corporate accounting valuations these aren't required.

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