

# Reflecting credit in the fair value of financial instruments

A survey





# Contents

<b>Introduction</b>	<b>2</b>
<b>Executive summary</b>	<b>4</b>
Key findings	4
What's in store for the future?	5
<b>Survey findings</b>	<b>8</b>
1. Does the institution record a credit adjustment to measure the fair value of derivative assets, derivatives liabilities and fair value option (FVO) liabilities?	8
2. What is the general methodology in use for calculating credit valuation adjustments (CVA)?	10
3. What is the general methodology in use for calculating debit valuation adjustments (DVA) and own credit adjustments?	12
4. How is the exposure input into the CVA/DVA calculation generated?	12
5. At what level is the exposure calculated?	13
6. Does the financial institution remove any derivative positions from the calculation of CVA and DVA, and if so why?	14
7. Does the financial institution remove any positions from the calculation of credit adjustments on FVO liabilities, and if so, why?	14
8. Does the financial institution take collateral into account when generating exposures?	16
9. What probabilities of default are applied to exposures to calculate a CVA/DVA?	17
10. What credit spreads are applied to exposures to calculate a CVA/DVA?	18
11. What credit spreads are used for calculating own credit adjustments?	19
12. To what extent is the calculation of credit adjustments automated?	22
13. Does the financial institution perform an analysis of the actual spread achieved on unwinds?	23
14. Does the financial institution actively manage CVA, DVA and own credit adjustments?	23
15. Briefly describe the CVA management function's structure and role	24
16. At which level are credit adjustments booked?	25
17. Are any significant changes to the CVA/DVA methodologies planned for the future?	26
18. Are any significant changes to the calculation of own credit adjustment planned for the future?	27
<b>Contacts</b>	<b>28</b>

# Introduction

The last few years have been among the most turbulent ever seen in the financial services industry. The credit crisis has highlighted the need to reflect credit risk appropriately in the fair value measurement of financial instruments.

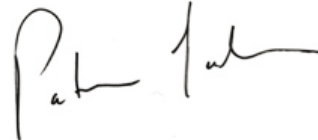
With uncertainty across the markets, many institutions have suffered significant volatility in their results because of movements in credit spreads. In addition to this volatility, some of these institutions have found that their credit adjustment models did not always accurately reflect their true exposure. Whilst the methodologies and assumptions were reasonable during periods of low volatility, they did not hold true during the credit crisis. In the wake of the crisis, many institutions are now revisiting their models and assumptions and refining them.

Since the start of the credit crisis, Ernst & Young has discussed credit adjustments under IFRS with a number of clients. In the autumn of 2010, we surveyed sixteen financial institutions that apply IFRS to benchmark current practice for calculating credit adjustments on financial instruments at fair value: derivative assets, derivative liabilities, and liabilities accounted for under the fair value option (FVO). The purpose of this survey was to identify emerging trends and note any different approaches taken to credit adjustments.

This paper outlines the survey results and the reasons given by respondents for the various approaches used. We hope that you find it interesting and insightful. Please get in touch with us or your usual Ernst & Young contact if you would like to receive a presentation on the results contained in this report, including where your institution falls within the benchmarking study.

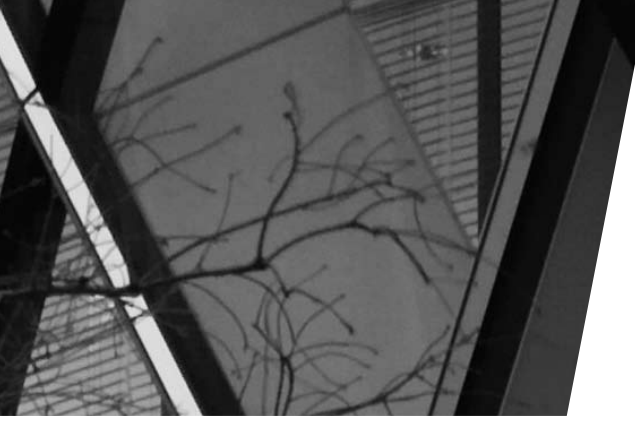


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## Definition of terms

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**Fair value for financial instruments** is defined in IAS 39 *Financial Instruments: Recognition and Measurement* as the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction

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**Credit risk** as defined in IFRS 7 *Financial Instruments: Disclosures* is the risk that an entity will fail to discharge a particular obligation

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**Non-performance risk** is defined in SFAS 157 *Fair Value Measurements* (ASC 820) as the risk that an obligation will not be fulfilled

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**Credit Valuation Adjustment (CVA)** relates to the credit adjustment on a positive derivative exposure. CVA is a reflection of the cost of protection required to hedge the credit risk of counterparties to an entity's over-the-counter derivatives portfolio. The purpose of a CVA is to measure the potential loss that stems from the cost to the entity of replacing the existing derivative contract at the time of the counterparty's default (less any recovery received from the defaulting counterparty)

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**Debt Valuation Adjustment, or Debit Valuation Adjustment (DVA)** relates to the credit adjustment on a negative derivative exposure. DVA is a reflection of the cost of protection required for the counterparty to hedge the credit risk of the reporting entity in their over-the-counter (OTC) derivatives

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**Own credit adjustment** relates to credit adjustment on non-derivative liabilities accounted for under the fair value option (FVO)

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**Credit adjustment** is used throughout to refer to CVA, DVA and own credit adjustment, collectively

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**Wrong way risk** occurs when the exposure to a counterparty is correlated with the credit quality of that counterparty (i.e., the credit risk is likely to increase in the same circumstances as the derivative is likely to increase in value). Wrong way risk, as an additional source of risk, is of concern to banks and regulators

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# Executive summary

In the autumn of 2010, we surveyed sixteen financial institutions to obtain information on current practices for calculating CVA, DVA and own credit adjustments under IFRS. We also included a number of questions about CVA management and the organisational structure to better understand their processes and identify any practical, operational difficulties around calculating credit adjustments.

## Key findings

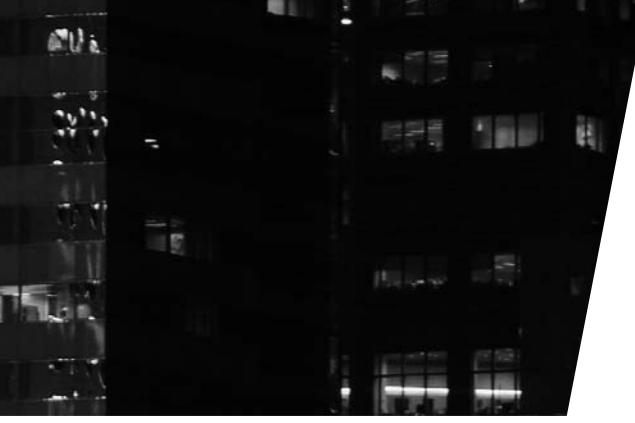
### ► Institutions use different methodologies in practice

Whilst IFRS requires that credit risk is taken into account when determining fair value of financial instruments, it is not prescriptive as to the methodology that should be used to measure a CVA, DVA or own credit adjustment. As a result, we found that the respondent's methodologies differ, as shown by the table below:

	CVA	DVA	Own credit adjustment on FVO liabilities
Collective impairment model	10	4	0
Mark to market approach	3	2	16
Alternative method	2	0	0
No credit adjustment taken	1	10	0
Total	16	16	16

### ► Credit adjustments recorded

Whilst all institutions surveyed apply CVA and own credit adjustments to FVO liabilities – unless the adjustment is not material, only six respondents record a DVA on negative derivative exposures. Non-performance risk cannot be ignored in determining the fair value of a liability under IFRS, but some entities consider that the amount is not material given the price that would be achieved on the settlement of a derivative liability.



► **Methodology**

Approaches to calculating credit adjustments vary between institutions in terms of sophistication. Many respondents are taking steps to refine their CVA and DVA methodologies, with trends towards recording DVA on negative derivative exposure, placing higher reliance on market data and increasing the sophistication of exposure measurement.

► **Market observable versus historical or averaged credit risk data**

We noted that many respondents apply historical data to exposures in order to calculate a CVA or DVA. Also, some apply averaged data to make their credit adjustment computations. Whilst certain entities believe that using available market-observable data as at the balance sheet date (such as bond spreads and credit default swap prices) or implying from market observable data gives the best indication of fair value, others contend that the use of historical or average data provides a better reflection of the price at which the derivatives could be exchanged or settled.

► **CVA Desk**

Around one third of respondents have a dedicated function to actively monitor and reduce CVA arising on OTC derivatives. Four respondents that currently do not actively manage CVA in this manner are considering setting up a CVA desk to manage credit risk exposure on derivatives.

## What's in store for the future?

► **How will the IASB's exposure draft on fair value measurement impact credit adjustments?**

The expected IFRS fair value measurement standard (the Standard), based on SFAS 157 (ASC 820), emphasises that fair value is an exit price, not an entry price. The Standard defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly market between market participants at the measurement date. Moreover, it is assumed that the orderly transaction takes place in either the principal market for that asset or liability or, if there is none, the most advantageous market. Hence, the measurement takes into account the characteristics of the asset or liability that would be considered by market participants in setting a price in that market, which would include non-performance risk. Helpfully, the Standard is expected to clarify that where an entity holds a portfolio of financial instruments, such as derivatives, with credit exposure to a particular counterparty, the CVA can be calculated on a net exposure basis, provided that is how the risk is managed and the reporting entity has a legally enforceable right of offset in place.

The Standard is expected to clarify that the fair value of a financial liability includes the effect of non-performance risk, although the impact will be affected by any credit enhancements related to the liability, such as collateral. In addition, similar to the existing guidance in ASC 820, the Standard is expected to include an assumption that the non-performance risk related to the liability is the same before and after the transfer of the obligation. Such an assumption effectively means that the liability would be transferred to a market participant of equal credit standing to the reporting entity on the measurement date. However, the implications of such an assumption on the DVA recorded for derivative liabilities are unclear to some constituents who believe this concept may conflict with the requirement to consider the exit price in the principal market for the derivative liability. If the market participants for OTC derivatives are assumed to be dealers, as indicated in an illustrative example that is likely to be imported from SFAS 157 (ASC 820), these constituents question how non-performance risk can be assumed to remain unchanged in those situations when the reporting entity is below investment grade, as dealers with the same level of non-performance risk likely do not exist. Notwithstanding these concerns, the application of this guidance under US GAAP has resulted in a generally consistent view on the need to incorporate the effect of own credit risk in the fair value of derivative liabilities.

► **A glance at Basel III and CVA**

One issue that emerged from the financial crisis was the exposure of the banks to what is called 'wrong way risk' with regard to counterparty exposures. As the situation deteriorated and market volatility grew, exposures through derivatives increased and, at the same time, concerns were raised about the credit worthiness of different counterparty banks. Spreads rose sharply and the CVA accounting adjustments (for the portion of a derivative price that reflects counterparty credit risk) also increased sharply and became a key driver of volatility in the statement of financial position and profit or loss.

To deal with this going forward, the Basel committee is proposing a new CVA charge and also stressed inputs into models for counterparty exposures for regulatory capital purposes. This has led to concerns about double counting and excessive capital requirements. Following an industry quantitative impact study, a proposal for a multiplier applied to the CVA charge has now been dropped. Even so, the new counterparty treatments are the main driver behind the increase (by 3 to 4 times) in the trading book requirements faced by firms.



The proposed approach to the CVA regulatory capital charge also raises incentives issues about hedging. Following hedging of counterparty risk, a bank could be required to hold more capital than a less efficiently hedged bank. The best outcome would be for banks to be able to use their own internal Value at Risk (VaR), by including the exposure as if it were a bond, with all of the hedges. The Committee has agreed to review the approach but it is uncertain how far they will move in this direction.

New risk management standards have also been introduced to cover counterparty risk. Regulators will be expecting substantial improvements over a range of aspects including collateral management, robustness of management information over collateral concentrations and re-use, backtesting and validation, stress testing and management of wrong way risk. Poor operational effectiveness of the collateral management function will be directly penalised (e.g., where disputes over how much collateral should be called occur), and so will failure to meet new validation standards under the new rules.

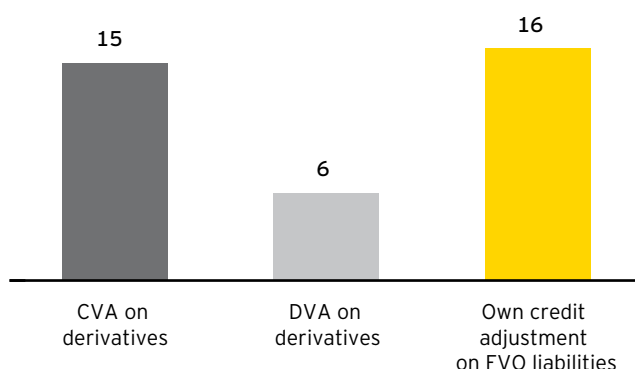
By raising requirements on OTC derivatives, the regulators want to incentivise better risk management through better hedging of CVA risk and also want to encourage greater use of central counterparty clearing for eligible contracts. But changes brought about by Basel III are not the end of it. Regulators are due to carry out a "fundamental review" of the trading book rules in 2011, when they will revisit the approach to the CVA charge and the interaction between the prudential framework and the accounting rules.

# Survey findings

## 1. Does the institution record a credit adjustment to measure the fair value of derivative assets, derivatives liabilities and fair value option (FVO) liabilities?

Although 15 out of 16 survey respondents indicated that they record a CVA on derivative assets and all record own credit adjustments on FVO liabilities, just six out of 16 apply a DVA to derivative liabilities.

### Credit adjustments applied to financial instruments



Recording a CVA is standard practice, just one participant does not record a CVA because it is not material. This is because its derivative exposures are mainly to investment grade counterparties and also because of the impact of collateral.

Limiting derivative exposure to investment grade counterparties is a commonly used method of managing derivative credit risk. However, on its own, this method is normally insufficient as it does not incorporate the effects of credit risk into the valuation of derivative contracts. Dealers in OTC derivatives normally record a CVA on the positions they hold with other dealers who are highly rated, since credit risk is taken into consideration when pricing transactions.

Recording a CVA is clearly necessary if the counterparty's rating is downgraded after entering the contract. However, the credit crisis has also shown that even highly-rated counterparties may be subject to non-performance risk and are not immune to changes in expectations about their ability to perform. Furthermore, the price of buying protection against many investment grade counterparties has increased over the last two years, even where their credit ratings were unchanged, so the impact of the credit adjustment made to arrive at fair value has increased. There is also now more variety in the cost of credit for investment grade counterparties with the same rating, showing that markets do not view all counterparties with the same rating as posing the same risk. Finally, the recent significant increase in the use of collateral for transactions with investment grade names also demonstrates that market participants are concerned about exposure to highly rated counterparties.



As just six respondents record a DVA on derivative liabilities, it does not appear that DVA is currently an accepted industry standard. Some of the participants who do not record an adjustment argued that IAS 39 is not explicit in requiring an adjustment on derivative liabilities. However, the survey did appear to indicate an industry trend towards recording a DVA, with one respondent introducing a DVA methodology in 2009 and another respondent planning to adjust its derivative valuations for DVA in 2010.

Over the last 18 months, there has been debate among European financial institutions about whether credit adjustments to derivative liabilities are required under IFRS. As market participants would consider counterparty credit risk in pricing financial instruments, it is necessary to incorporate both counterparty credit risk and own credit risk to reflect non-performance risk in the fair value of financial instruments under IFRS. However, some respondents believe that the extent to which credit spreads would actually be reflected in derivative pricing is much less than would be suggested by some CVA and DVA methodologies. Consider an interest rate swap between a bank and a corporate counterparty that is in an asset position to the bank. The credit spread that the bank might use to calculate the CVA adjustment for a derivative asset may not be the same as the credit spread that the corporate swap counterparty applies to reflect its own credit risk in a derivative liability, since they are on different sides of the bid-offer spread. The bank should make full provision for the CVA as it would be reflected in an exit price, but the corporate counterparty may not gain the full DVA as the bank to which the derivative is settled is unlikely to give full recognition to it.

The issue of credit adjustments on derivative liability positions was addressed in the Expert Advisory Panel (The Panel) report entitled, *“Measuring and disclosing the fair value of financial instruments in markets that are no longer active”*, published in October 2008. The Panel was convened at the request of the IASB in order to produce written guidance on fair value for market participants. The Panel’s report noted an inconsistency in market practices with respect to recording a DVA on derivatives liabilities:

“There is some inconsistency in practice about whether entities make adjustments for own credit when valuing derivative liabilities. A fair value includes the effect of own credit risk. An entity that does not include own credit when valuing derivatives presumably does so because of credit enhancements (e.g., posted collateral), or it has concluded that the effect is not material.”

In contrast to the diverging practices of European institutions, the issuance of SFAS 157 Fair Value Measurements (ASC 820), has resulted in a generally consistent view amongst US institutions on the need to incorporate the effect of own credit risk in the fair value of liabilities. This is likely because US GAAP is more explicit on the subject, stating in ASC 820 that “the fair value of the liability shall reflect the non-performance risk relating to that liability” and “the reporting entity shall consider the effect of its credit risk (credit standing) on the fair value of the liability in all periods in which the liability is measured at fair value”. In addition, ASC 820 states that “[a] fair value measurement assumes [the] non-performance risk relating to that liability is the same before and after its transfer.” This topic has also been an attention point for regulators.

IAS 39 differs from SFAS 157 Fair Value Measurements (ASC 820) in that it defines the fair value of a liability as the amount for which a liability could be settled between knowledgeable, willing parties in an arm's length transaction, whereas paragraph 15 of SFAS 157 discusses the concept of transferring liabilities rather than settling them. Some entities believe that a DVA would not be reflected in a price to settle a derivative liability. Note that with the introduction of the new standard on Fair Value Measurement, the transfer wording will be imported into IFRS.

A further reason given over the last two years for not recording a DVA on derivative liabilities under IFRS is that certain institutions continue to find the recognition of an accounting gain when its creditworthiness has deteriorated to be counterintuitive, and question the appropriateness of an entity recognising a gain that is, in their view, unlikely to be realised. The new standard, IFRS 9 *Classification and Measurement of Financial Liabilities*, has helped address this contentious issue for FVO liabilities by proposing that changes in the valuation due to changes in own credit standing be recorded in other comprehensive income (OCI) and not in profit or loss unless presentation of the fair value change in respect of the liability's credit risk in OCI would create or enlarge an accounting mismatch in profit or loss. However, IFRS 9 does not address concerns noted above for derivative liabilities as they will have to be recorded at fair value through profit or loss, including movements due to credit risk.

## **2. What is the general methodology in use for calculating credit valuation adjustments (CVA)?**

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The survey results in question 1 clearly show that recording a CVA is industry standard amongst financial institutions. However, as no specific methodology is prescribed in the accounting literature, a number of different approaches are used in practice by derivative dealers and end-users to estimate the effect of credit risk on the fair value of derivative contracts.

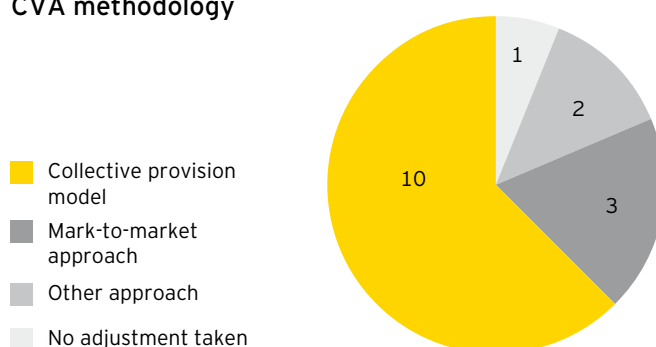
Certain large derivative dealers determine a counterparty level DVA or CVA by considering both current and expected exposures generated using simulation techniques, such as Monte-Carlo simulation, and assumptions about the volatility of the applicable underlying variables that can result in both positive and negative exposures.

Other financial institutions use less complex approaches that consider only the current exposure of their derivative positions to determine DVA and CVA adjustments.

The degree of sophistication in the methodology used by an entity is often influenced by a number of quantitative and qualitative factors including, but not limited, to:

- ▶ The materiality of the entity's carrying value of derivatives to its financial statements
- ▶ The extent to which derivative instruments are either deeply in-or out-of-the-money
- ▶ The existence and terms of credit mitigation arrangements (e.g., threshold levels of collateral arrangements)

### CVA methodology



Over time, we have noted an evolution by some institutions to more robust methodologies.

Ten participants calculate CVA based on a formula which is similar to Basel II collective provisioning methodology. Under this methodology, the CVA is generally calculated as the product of Exposure, Probability of Default (PD) and Loss Given Default (LGD), or:

$$\text{CVA} = \text{Exposure} \times \text{PD} \times \text{LGD}$$

There are a variety of ways that each of these inputs can be determined:

- ▶ **Exposures** can be based on a range of options from model simulations to present value. See question 4 where this subject is discussed in more detail.
- ▶ **Probability of default** can be sourced from internal tables used for regulatory calculations or implied from market observable data. It is also sometimes based on a combination of the two. See question 9 for the survey results in this area.
- ▶ **Loss given default** can be derived from a wide variety of sources in order to estimate the level of recovery expected on the specific instrument in the event of default. LGD is determined by each institution at the transaction and counterparty level where possible and takes into account the seniority of the instrument and the level of collateral available.

Three participants use a so called mark-to-market approach for calculating CVA. Under this approach, the participants generate expected exposures and apply market-observed credit default swap spreads directly to these exposures.

Two further participants perform alternative methods that do not fall directly into either category, but calculate exposure in a more proprietary manner.



### 3. What is the general methodology in use for calculating debit valuation adjustments (DVA) and own credit adjustments?

All six respondents that record a DVA use the same calculation approach as for CVA, i.e., they apply the same model to negative derivative exposures to calculate adjustments as for positive exposures. Four respondents use a collective impairment model and two use a mark-to-market approach.

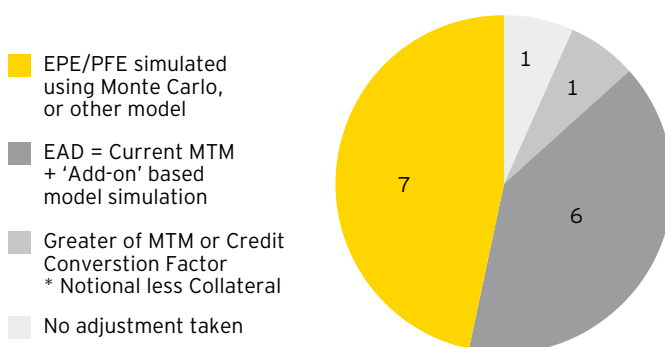
The 16 institutions calculating own credit adjustments on FVO liabilities use a mark to market approach: they apply an observable own credit spread curve to their current exposure at the balance sheet date.

All surveyed institutions that record a DVA apply a different methodology to assess their DVA and their own credit adjustment on FVO liabilities. The differences include the method for measuring exposure and the credit spread curve which is applied. For example, one survey respondent uses secondary market data for its DVA calculation, and primary market data for the own credit calculation. See questions 10 and 11 for further detail on the curves used in the calculation of DVA and the own credit adjustment, respectively.

### 4. How is the exposure input into the CVA/DVA calculation generated?

This question on exposure management elicited the widest variety of responses from our survey participants.

#### Exposure measurement



Exposure simulation using a model, most commonly a Monte Carlo model, is applied by five out of ten participants who use a collective provision method. It is also applied by two out of three participants applying a mark-to-market approach.

The remainder of participants applying the collective provisioning method (five out of ten) and mark-to-market method (one out of three) measure exposure by using an Exposure at Default (EAD) calculation consisting of the current mark-to-market of the positions and adjusting them with an "add-on" which is based on a model calculation. EAD is a measure of potential exposure (in currency) as calculated by a credit risk model for the period of one year or until maturity, whichever is the sooner. The add-on represents the exposure beyond the horizon represented by the EAD.

For the six participants recording a DVA, four record the DVA for Expected Negative Exposures (ENE) using a model simulation. The other two calculate the EAD using the current mark-to-market value, if negative, and adjusting for a model-based "add-on".

	MTM CVA	Collective provision CVA	Other	Total CVA	DVA
Model simulation	2	5	0	7	4
Current MTM + 'add on'	1	5	0	6	2
Other	0	0	2	2	0
<b>Total</b>	<b>3</b>	<b>10</b>	<b>2</b>	<b>15</b>	<b>6</b>

## 5. At what level is the exposure calculated?

All 15 survey participants who record a CVA and the six who record a DVA, determine it at counterparty level, based on the portfolio of all contracts with a given counterparty, and not at a deal level. They do so by offsetting derivative positions by counterparty, based on ISDA master netting agreements in place.

For the majority of participants, exposure is netted by counterparty for the purposes of calculating the CVA on an entity-wide basis. Some participants net their exposures by counterparty on a business line by business line basis and/or on a book-by-book basis, although master netting agreements may be in place at group level. In such case, the netting effect is reduced and the assessed CVA is higher.

Master netting agreements are legally binding contracts between two counterparties to net exposures under other agreements or contracts (such as OTC derivative contracts) between the same two parties. In cases of default, these agreements serve to protect the parties from paying out on the gross amount of its payable positions while receiving less than the full receivable amount on its gross receivable positions with the same counterparty. Where these are in place, it is considered appropriate for the entity to consider the portfolio of derivatives by counterparty as the unit of valuation for the purposes of determining the CVA. Conversely, in cases where a master netting agreement is in place, if an entity were to take the sum of individual exposures, the credit exposure could be overstated and the resulting credit adjustment would also be overstated.

The IASB has specifically accepted that credit risk may be assessed for valuation purposes on a counterparty-by-counterparty basis in developing its new standard on Fair Value Measurement - see *'What's in store for the future'* in the executive summary on page 5 for further detail on the proposed IFRS.

## 6. Does the financial institution remove any derivative positions from the calculation of CVA and DVA, and if so why?

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The majority of participants indicated that all derivatives are included in the CVA and DVA calculation. Some participants indicated that certain positions are removed from the calculation, such as derivative instruments used in hedge relationships, derivatives with retail counterparties (applicable to DVA) because they believe that the retail counterparty does not consider credit spreads in the price and collateralised derivatives.

One participant told us that they remove all derivative positions with counterparties rated AA or better, because they believe that the LIBOR curve used in the valuation accurately captures the risk of the counterparty in these instances.

## 7. Does the financial institution remove any positions from the calculation of credit adjustments on FVO liabilities, and if so, why?

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Out of the 16 respondents who record own credit adjustments to FVO liabilities, 14 answered further questions on this adjustment.

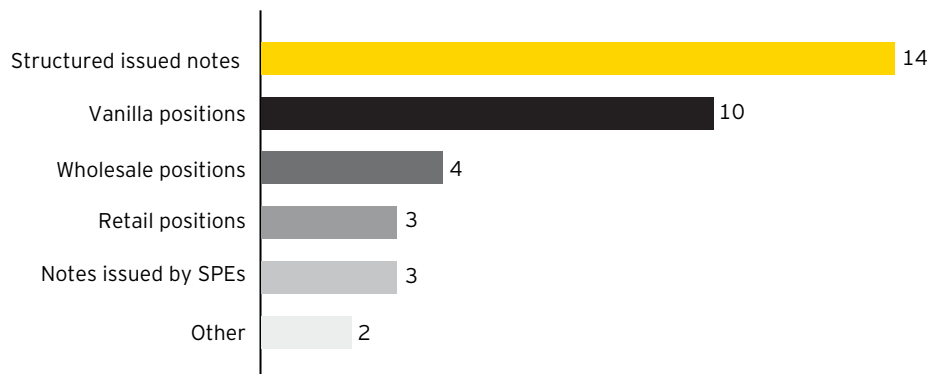
Eight respondents apply an own credit adjustment to all of their FVO liabilities, whilst six exclude certain liabilities, for example:

- ▶ **Retail positions:** Some institutions argue that the behaviours of customers should be considered, and that notes designated at FVO issued to retail clients could be excluded because the retail client does not take credit quality into account and is only concerned with product pricing
- ▶ **Short term liabilities** for materiality reasons
- ▶ **Certain listed notes**, for which the listed price is considered to include already the own credit risk component

The survey respondents do not have the same FVO liabilities portfolio, and therefore they do not have the same scope of products to which they apply an own credit adjustment. This is reflected in the chart below, which discloses the number of institutions applying credit adjustments to each kind of product included in their FVO liabilities portfolios. In this table, retail positions refer to notes issued to retail counterparties, wholesale positions refer to notes issued to other financial institutions, and vanilla positions refer to non-structured issued notes.

The graph also reflects the fact that different banks characterise their positions and counterparties in different ways.

### FVO liabilities subject to own-credit adjustments



Under IFRS, it is a requirement to record own credit adjustment to all financial instruments at fair value – see the discussion under question 1.

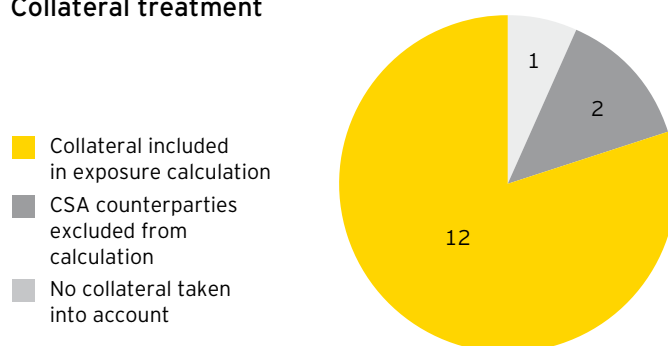
Some entities commented that they exclude retail positions from the calculation on the basis that retail investors are not concerned with pricing. However, should the institution's creditworthiness deteriorate to a large extent, this position could change. We note that certain entities who took this view before the credit crisis realised that the change in creditworthiness was impacting pricing of products with retail investors and the argument for excluding these positions became less tenable. (It should be noted that this approach also reflects the fact that IAS 39 refers to 'settlement' of liabilities rather than the notion of a 'transfer' that will be embedded into the new fair value standard.)

The survey results demonstrate that notes issued by Special Purpose Entities (SPE) are currently included within the scope of own credit adjustments by two respondents. Whilst own credit adjustments on notes issued by SPEs are currently taken by these entities, IFRS 9 clarifies that credit risk as defined in IFRS 7 is different from asset-specific performance risk. Credit risk is the risk that an entity will fail to discharge a particular obligation. Asset-specific performance risk is the risk that an asset or assets will perform poorly, with a direct impact on the performance of the related liability due to a contractual relationship between the assets and liabilities. One of the examples cited in IFRS 9 is notes that are issued by an SPE. In this example, amounts due to the SPE's investors are restricted to the cash flows generated by the SPE's underlying assets. The assets of the SPE are legally isolated and ring fenced for the benefit of the investors. In this example, the entire movement in the fair value of the liability is deemed to reflect the asset performance and there is no credit risk. However, this distinction included in IFRS 9 does not impact the fair value measurement, rather where the components of fair value movements are recorded.

## 8. Does the financial institution take collateral into account when generating exposures?

The survey showed that all but one of the respondents take collateral into account when calculating the CVA.

### Collateral treatment



The most popular approach is to include collateral as part of the calculation of the exposure.

Two participants responded that they do not simulate collateral, due to system or data limitations, but instead remove all counterparties with which they have a Collateral Service Annex (CSA) under the ISDA guidelines. They argued that a combination of the collateral posted under the CSA, and the generally high credit quality of such counterparties means the CVA on these positions would be immaterial.

One participant does not take collateral into account. This participant removes all counterparties with a rating better than AA from their CVA calculation (see question six).

It should be noted that collateral may reduce the risk of credit default, but does not reduce the counterparty credit risk to nil. This is because, under many CSAs, collateral is not posted until a certain exposure threshold is reached. In addition, the collateral can decrease in value or the derivative may increase in value and additional collateral cannot be obtained exposing the entity to "gap" risk. With high quality collateral and regular monitoring, the effect of these concerns may be immaterial, however such a judgment should be regularly re-assessed.

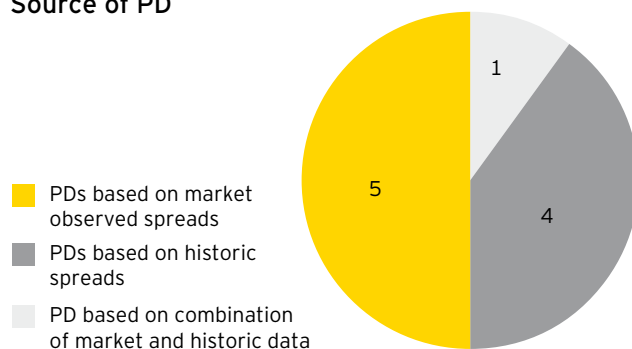
Ongoing changes in regulation of the OTC derivatives market should result in an increase of collateralised transactions. Consequently, the magnitude of some CVA and DVA adjustments may decrease in the future.



## 9. What probabilities of default are applied to exposures to calculate a CVA/DVA?

This question only applied to those respondents calculating CVA and DVA using a version of their collective provisioning model, as discussed in question 2. For over half of the participants who perform a CVA calculation using PDs, the PDs applied are based on market observable information. Where historical information is used, the most common source of PD is the institution's Basel II reporting tables.

### Source of PD



Four of the participants extract PDs from internal tables used for regulatory calculations, rather than using a market observable PD that is close to, or at, the balance sheet date. The choice between an approach based on historical data and market implied data seems to be partly driven by the managing intent. Institutions that hedge the CVA through market instruments tended to use a mark to market approach. When determining the most appropriate source of the PD, an entity should consider the objective of incorporating inputs that reflect the assumptions of market participants in the current market. Historical PDs tend to be lower than market observable PDs, and do not evolve quickly as the creditworthiness of an entity deteriorates.

Market observable PDs extracted from CDS spreads, or from another relevant indicator, are considered by most of the respondents as likely to be the best indicators for the occurrence of default. However, CDS spreads will likely not be available for many smaller public companies or private entities. In these instances, entities will have to be able to look to other available indicators of creditworthiness, such as publically traded debt or loans.

In the absence of any direct indicator of creditworthiness, entities may need to develop an estimated credit spread based on either a comparison to industry peers or an industry benchmark. In either case, identifying the appropriate peer group or benchmark is critical. For example, an analysis may include the generation of financial ratios intended to evaluate the financial position of the reporting entity's position vis-à-vis the peer group and their credit spreads. These ratios may consider liquidity, leverage, and general financial strength.

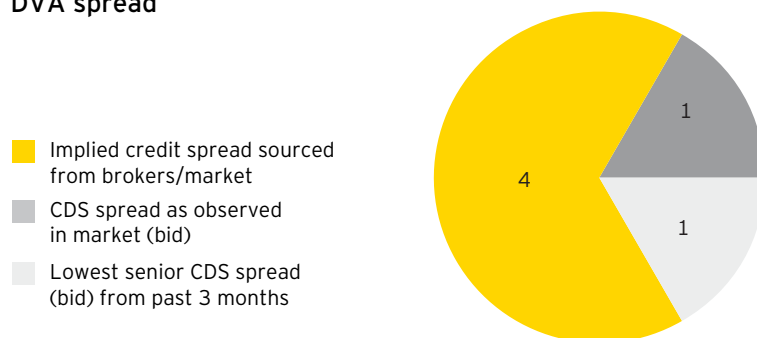
The use of historical default rates would seem to be inconsistent with an exit price notion, especially given the level of credit spreads in the current environment versus historical averages. However, those entities that use historical data contend that it is closer to the prices at which derivative transactions are actually priced in the market. One of the difficulties is that, in practice, few derivatives are traded and priced, except at the outset when their fair value is close to nil, so there is little market data available to 'back test' different methodologies to determine whether they do reflect market participants' pricing behaviours.

## 10. What credit spreads are applied to exposures to calculate a CVA/DVA?

For the participants who calculate a CVA by applying credit spreads directly to exposures, the credit spreads applied are based on market observable information. The CDS spread of specific counterparties is the most commonly used market observable input. These participants indicated that where a CDS spread is not available by counterparty, a generic industry/country/sector curve is applied as a proxy.

The responses to DVA provided us with a wider variety of answers, indicated on the chart below.

### DVA spread



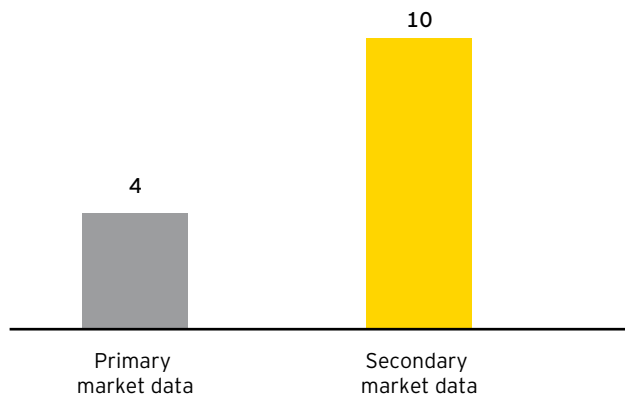
One institution applies unadjusted CDS spreads to the entire portfolio. Four use market-observed CDS spreads as a starting point, but may make adjustments depending on their own view of the market.

Some participants expressed a belief that it is unlikely they will realise the full DVA when closing out their derivative liabilities. This is reflected in their choice of spread; e.g., using the bid rate and using the lowest spread from the previous three months. One participant applies a haircut to their own credit spread for the purpose of calculating DVA, to reflect this concern.

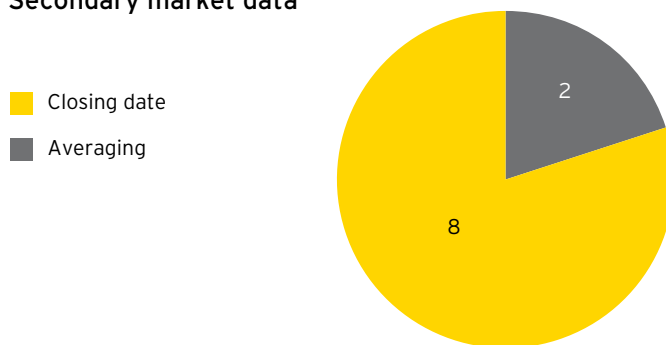
## 11. What credit spreads are used for calculating own credit adjustments?

Respondents use a mix of secondary market data or primary market data, as shown by the charts below and overleaf.

### Market data used to assess the own-credit spread

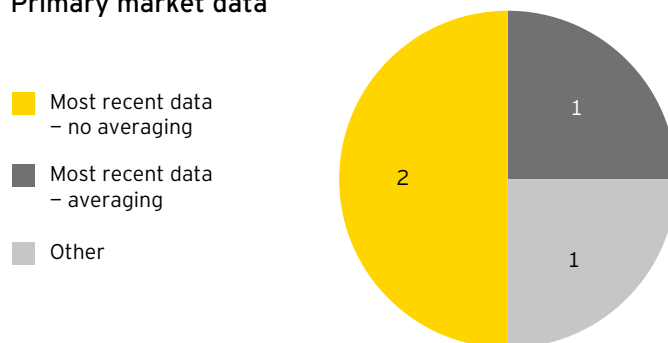


### Secondary market data



Ten out of 14 respondents use credit spreads observed on the secondary market, mainly CDS spreads as at the balance sheet date. Two institutions lower the effect of CDS spread volatility on their own credit adjustment, for example by averaging CDS prices over a few months. Another is using primarily the CDS spreads, but compares it with primary market data as a control to ensure the curves are not significantly different, and may decide to use primary market data in certain cases. Another uses broker quotes of credit spreads at the balance sheet date (although non-binding broker quotes are not fully observable data) and applies a bid-offer spread. Another respondent uses primary data for its short-term floating rate notes only.

## Primary market data



Four out of 14 respondents use primary market data, usually the credit spread applied to the most recent notes they issued prior to the closing date, with one bank averaging it over a few months. One participant uses a funding curve set internally by relevant governance as a guide for the Treasury department. They then analyse transactions that occurred between the setting of the curve and the closing date, using deviations from the curve to determine whether these represent a better pricing than the funding curve itself.

Five out of the 10 respondents that use secondary market data apply a bid-offer spread to the mid price, and one is directly using the offer funding spread. The four institutions using their primary credit spreads directly do not adjust for a bid-ask spread. Primary credit spreads tend generally to be lower than credit spreads observed on the secondary market.

Most survey respondents apply different credit spreads to their FVO instruments, based on the maturity of the liability, the seniority of the debt issued and the collateral where applicable. Two survey respondents apply different credit spreads to their FVO liabilities based on the geographic region of the issue, whereas other institutions use a single credit spread worldwide for materiality reasons. Where institutions use different inputs based on the spread at which they can issue in a particular country or region, they could also analyse secondary market spreads to support the calculation.

One institution adjusts the credit spread observed for actively traded instruments to calibrate the spread on structured instruments not quoted in an active market. One entity adjusts the credit spreads used to calculate the own credit adjustment on FVO liabilities to take account of the fact that it might not achieve the full spread on close out. Two respondents have defined impact thresholds below which the own credit adjustment is not amended.

The credit spread used in the credit adjustment calculation should be the one that participants would expect to be reflected in the pricing if they were to take on the credit risk of the instrument. Different types of curves might be appropriate for different entities and instruments, depending on the quality of data available and the instrument being valued. An entity should take into account various factors, including assessing where the liability falls in the liquidation structure when evaluating which source of credit data provides the most relevant and appropriate information that market participants would use to reflect the entity's credit risk in measuring the fair value of the instrument. Entities should therefore apply judgment when selecting an appropriate credit spread to derive fair value.

Another issue is whether and how liquidity premiums should be taken into account when calculating own credit adjustments on FVO liabilities. The current guidance on how to measure the change in the fair value of a liability as a result of a change in the liability's credit risk is included in IFRS 7. The default method in the guidance suggests that any changes in fair value other than changes in market risk factors, such as a benchmark interest rate, are attributable to the credit risk of the liability. This would include any liquidity premium associated with the liability. Certain institutions have proposed amendments to their observed credit spreads because of the fact that the credit spread is not a pure representation of default risk, particularly in illiquid markets. IFRS 7 notes that other methods are acceptable if they provide a more faithful representation of the changes in the fair value of the liability attributable to the changes in its credit risk. It follows that in illiquid markets it would be acceptable to apply another method of calculating the effects of own credit on fair value in a different manner which excludes the liquidity risk on the liability.

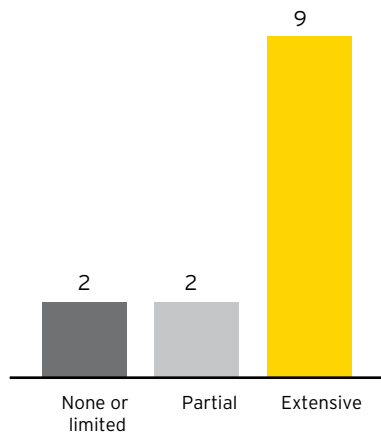
During 2009, we noted a trend towards entities applying an average credit spread the calculation of credit adjustment on FVO liabilities. The method of averaging varies, however, many institutions average the credit spread observed in the market over, for example, three months up to balance sheet date and use this three month average figure in the own credit calculation rather than the credit spread observed in the market on balance sheet date. Although there is no quantitative rationale supporting averaging the credit spread in the assessment of fair value, many financial institutions argued that the volatility in their own credit spreads, and the market conditions at the time, meant that the credit spread on balance sheet date was not necessarily reflective of their own performance risk. Therefore, these entities applied an average credit spread in determining the level of credit adjustment to apply to fair values.



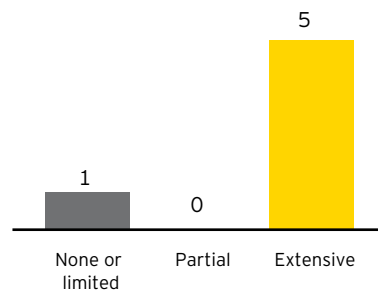
## 12. To what extent is the calculation of credit adjustments automated?

The majority of respondents reported having an extensive level of automation to assess CVA and DVA (when calculated), and a manual process to assess the own credit adjustment (when calculated). Some extract data from front-office, risk management or accounting systems and calculate the own credit adjustment on FVO liabilities on an Excel spreadsheet. The reason for this is that own credit calculations are typically performed on an entity level for financial reporting purposes, whereas CVA and DVA are calculated at a lower level within the organisation and on a larger population of exposures.

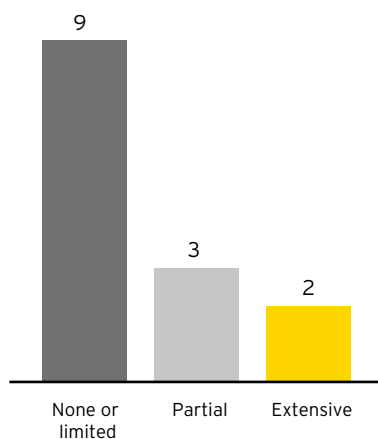
Extent of automation in the CVA



Extent of automation in the DVA



Extent of automation in the own credit adjustment calculation



**13. Does the financial institution perform an analysis of the actual spread achieved on unwinds?**

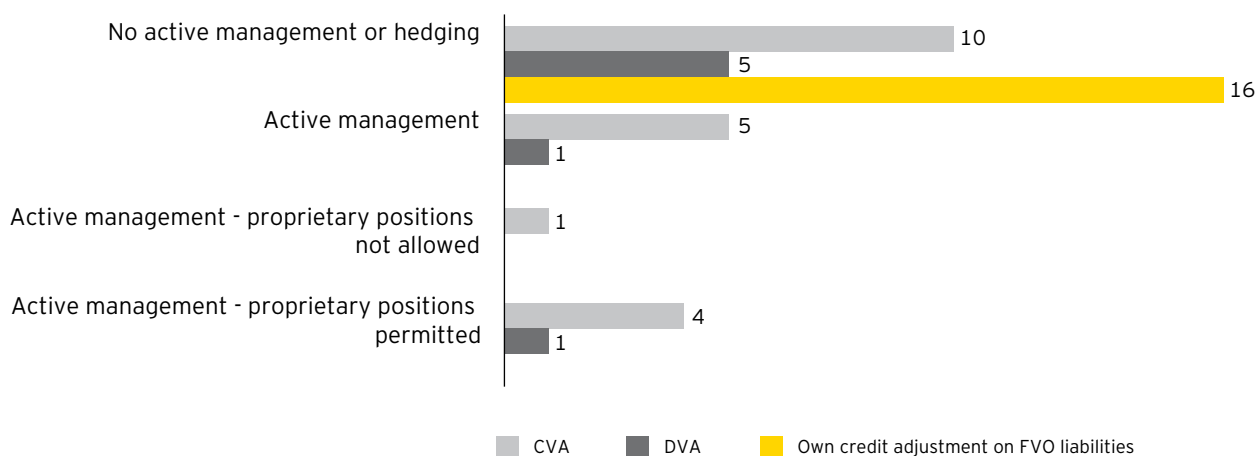
The majority of respondents who have bought back their own debt (8 out of 11) performed an analysis to compare the spreads applied in the own credit calculation to the spread that they actually achieved on the buy back. This back-testing is seen as a key control on own credit adjustment and leading practice, although the use of settlement prices will render the control less useful once the new standard on fair value measurements is finalised. See *'What's in store for the future'* in the executive summary on page 5 for further detail on the proposed IFRS.

**14. Does the financial institution actively manage CVA, DVA and own credit adjustments?**

Over the last few years, we have seen a transition to active management in the marketplace, with more frequent calculations of CVA (daily and sometimes even intraday) and dedicated functions to actively monitor CVA and manage the resulting risk. Out of the sixteen institutions surveyed, five actively manage the credit risk arising on derivative liabilities to reduce CVA (refer to question 15), one actively manages the DVA. No respondent hedges the own credit adjustment on FVO liabilities.

In four out of the five institutions that actively manage the CVA, the department in charge of CVA management is allowed to take proprietary positions, i.e., to take external credit risk. Refer to question 15 for further detail.

**Credit adjustments management**



## **15. Briefly describe the CVA management function's structure and role**

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Reporting lines for CVA and DVA management vary between the institutions surveyed. Some institutions have set up CVA desks to centralise the quantification, pricing and management of the counterparty credit risk, and in certain cases the own credit risk, generated by the market transactions of their trading desks. They have developed an internal method for transferring credit risk from a trading desk to the CVA desk, and for charging the trading desk for credit risk. CVA desks are typically involved in pricing credit risk into bespoke transactions, taking into account the incremental credit risk for the institution. The relevant trading desk will then add the credit charge to its trade when pricing the trade in order to quote a price to the client. Once credit risk has been transferred to the CVA desk, the function manages the credit risk within the mandated risk limits.

CVA desks are typically a risk management function that hedge counterparties to which the institution is exposed. In certain cases, the hedging activity is limited to the CVA exposure of certain divisions, depending on how material the division is to the entity. Certain institutions consider their CVAs in a similar manner to trading positions and mandate their CVA desk to take proprietary positions when opportunities to generate profit (e.g., to take advantage of mispriced credit) are identified, within set market risk limits. This is the case for four respondents out of the five actively monitoring their CVA exposure and executing trades where necessary to reduce CVA, and for the respondent monitoring its DVA exposure.

### **Instruments commonly used to hedge credit exposure are:**

- ▶ Single-name CDS
- ▶ Index-linked CDS (e.g., iTraxx IG and CDX NA IG), mainly for illiquid names, maturities for which single-name CDS are illiquid, or sectorial/regional hedging
- ▶ Contingent CDS (i.e., CDS under which payment is triggered by both a credit event and another specified event)
- ▶ Interest rate and foreign exchange vanilla products, such as swaps, futures and options, to hedge the related components of the expected exposure
- ▶ Volatility hedges
- ▶ Correlation hedges

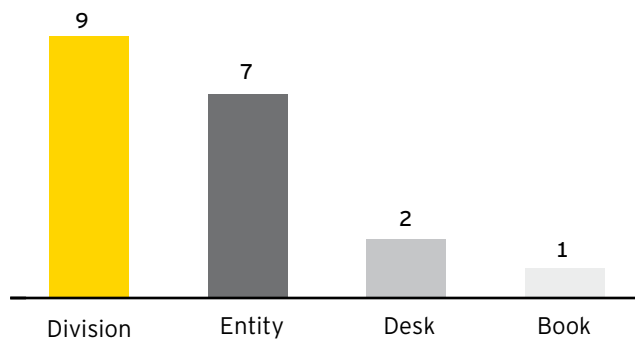
When CDS contracts do not exist, the CVA hedging strategy may in certain cases consist of short selling (i.e., borrow and then selling) securities issued by the counterparty. A few large investment banks also use credit swaptions, portfolio tranches, synthetic CDOs on illiquid names, or CDO bespoke structures with dynamic exposure directly linked to the expected exposure at default.

## 16. At which level are credit adjustments booked?

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Out of the 15 participants that record a CVA (and DVA when calculated) most book it at division and/or legal entity level. Two of them record CVA at desk level, following an internal allocation policy of the CVA calculated centrally. Another institution both calculates and records CVA at book level.

### Level at which CVA/DVA are booked



The respondents generally calculate and book own credit adjustments on FVO liabilities at central level, or at group or entity level, with no allocation to sub-reporting lines. The change in the entity's creditworthiness and the impact on the own credit adjustment are therefore not taken into account when establishing front office bonus levels.

## **17. Are any significant changes to the CVA/DVA methodologies planned for the future?**

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The majority of our participants said that an improvement or further development of their CVA/DVA framework is planned in the coming 12 to 24 months. For approximately a third, a major improvement or enhancement of methodology is expected within a year.

### **Developments considered include:**

- ▶ A move towards a mark to market approach and away from reliance on historical data
- ▶ A trend towards calculating a DVA, where no such adjustment is taken at this time
- ▶ An increasing scope of positions included in the calculations
- ▶ An improved sophistication in exposure measurement, for example increasing the number of exposure simulations per point-in-time in the current model
- ▶ Changes to the rating migration model to take into account implied PDs on neutral risk scenarios when not taken into account
- ▶ An allocation of CVA currently booked at division level to desks, to achieve the right behaviors at desk level
- ▶ System improvements to increase automation and eliminate one-off or specific calculations

A third of participants said they are watching developments in fair value measurement under the current IASB fair value measurement project and CVA capital requirements under Basel III.

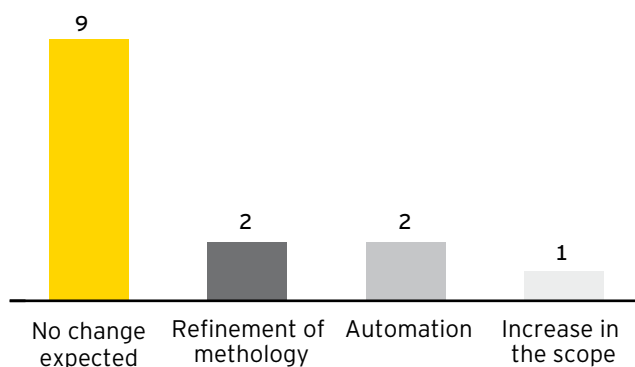
Also, four respondents out of ten that record a CVA and do not actively manage the CVA are considering setting up a CVA desk to manage the credit risk exposure on derivatives.

### 18. Are any significant changes to the calculation of own credit adjustment planned for the future?

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Apart from one institution that plans to increase the scope of the own credit adjustment on FVO liabilities to retail structured positions, no respondents anticipate significant changes in their own credit adjustment policies in the short term. Two institutions plan minor improvements to their methodology. Although most institutions highlighted the substantial time taken to perform the calculation, only two have a project in place to further automate the process.

#### Changes to the own credit adjustment calculation process expected in the future



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