

Consideration of Credit Risk in Fair Value Measurements

an addendum to PwC's *Guide to Fair Value Measurements*

2008

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Dear Clients and Friends:

Fair value accounting has been a topic of significant interest and debate over the past few years. There are many different views on how and when fair value should be used in financial reporting and the manner in which it should be measured. Fair value measurements may be straightforward when there is observable market information. However, when observable information is not available, management must develop valuation models, which are inherently more subjective. Recent market events and certain counterparty defaults have highlighted the importance of one of the most difficult aspects of many valuations – the consideration of credit risk in fair value measurements.

Financial Accounting Standards Board Statement No. 157, *Fair Value Measurements* (FAS 157), was issued in September 2006 to provide a consistent framework for the measurement of fair value. One of the fundamental concepts in FAS 157 is the requirement to incorporate nonperformance risk, including credit risk, in the measurement of fair value. This requirement has been one of the key challenges in applying FAS 157 to the measurement of certain assets and liabilities at fair value.

This publication, which is a companion to PwC's 2007 *Guide to Fair Value Measurements*, includes guidance for financial and accounting managers, valuation specialists, and auditors to deal with this challenge as reporting entities continue to work through the complexities of incorporating credit risk (which is often one of the largest components of nonperformance risk) in fair value measurements. Specific topics include:

- How credit risk impacts fair value measurements;
- How to measure credit risk when observable market prices including credit risk are not available – an example framework;
- How to incorporate key elements of credit risk into fair value measurements (e.g., when there are master netting arrangements, collateral, and other forms of credit enhancements);
- What market information is available in determining the appropriate credit risk adjustment to apply in measuring fair value; and,
- Which methodologies are appropriate for measuring credit risk.

This publication includes specific examples to demonstrate different methodologies available to measure credit risk, and illustrates how using different inputs may result in significantly different outcomes. Developing appropriate credit risk adjustments requires a deep understanding of the available market information, familiarity with the underlying credit risk theory, and application of management judgment. The examples provided are intended to illustrate the key concepts and assist reporting entities as they develop an approach to credit risk adjustments.

We hope that you find this publication useful.

PricewaterhouseCoopers

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Section 1: Concepts

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1.1 Overview

For most reporting entities, Financial Accounting Standards Board (FASB) Statement No. 157, *Fair Value Measurements* (FAS 157), has been effective since January 1, 2008, for financial assets and liabilities and for nonfinancial assets and liabilities measured at fair value on a recurring basis. One of the key challenges for many reporting entities in estimating fair value in accordance with FAS 157 has been determining and incorporating the impact of nonperformance risk, including credit risk, into the fair value measurement.

Nonperformance risk is the risk that an entity will not perform on its obligation. This risk should be incorporated into a fair value measurement using a market-based estimate that follows the framework of FAS 157 and should be measured from the perspective of a market participant. The concept of nonperformance risk incorporates credit risk and other risk factors, including regulatory, operational, and commercial risks. Credit risk is often the largest component of nonperformance risk, especially when the asset or liability to be measured at fair value is a financial asset or liability. However, credit risk may not be separately observable, making it difficult to determine an appropriate measurement methodology and the inputs necessary to make a reasonable fair value estimate.

This publication focuses on key considerations for incorporating credit risk in the measurement of fair value. Reporting entities should also consider the other components of nonperformance risk in developing fair value measurements.

1.2 Incorporating Credit Risk

The incorporation of nonperformance risk, including credit risk, is a key component of a fair value measurement. The FASB's focus on the importance of credit risk in the measurement of fair value is emphasized in FAS 157, paragraph C49, which states, in part:

... conceptually, credit standing is an essential component of a fair value measurement. A measurement that does not consider the effect of [an] entity's credit standing is not a fair value measurement.

FASB Staff Position (FSP) No. 157-3, *Determining the Fair Value of a Financial Asset When the Market for That Asset Is Not Active* (FSP FAS 157-3), further highlights the requirement to incorporate nonperformance risk in the measurement of assets and liabilities at fair value. FSP FAS 157-3, paragraph 9(b) states, in part:

Regardless of the valuation technique used, an entity must include appropriate risk adjustments that market participants would make for nonperformance and liquidity risks.

FAS 157 requires that reporting entities consider the effect of nonperformance risk, including credit risk, in determining the fair value of both assets and liabilities. In evaluating the credit risk component of nonperformance risk,

reporting entities should consider all factors that may impact the credit risk exposure including:

- **Master netting arrangements**^{1, 2} or other netting arrangements
- Collateral and other credit support
- Structure of the transaction
- Specific characteristics of the instrument being measured

All relevant factors should also be considered in calculating the credit risk adjustment to apply in measuring fair value. In general, the credit risk incorporated in the fair value measurement will vary depending on the exposure as follows:

- **Asset position** – The credit risk of the counterparty should be incorporated into the calculation of the credit risk adjustment. The reporting entity would incorporate the effect of the obligor’s credit risk in determining the price that a market participant would be willing to pay for the asset.
- **Liability position** – The reporting entity should incorporate its own credit risk as a component of the fair value measurement. FAS 157, paragraph 15, explicitly requires the inclusion of nonperformance risk (including credit risk) in the valuation of any liability reported at fair value.

Incorporation of counterparty credit risk for an asset and the reporting entity’s own credit risk for a liability is intended to cause the fair value measurement to reflect the credit risk exposure of an asset or liability as of the reporting date. A measurement of credit risk at a point in time is the approach typically used by reporting entities, other than a limited number of financial services companies, and is the primary focus of this publication.

1.2.1 Exceptions

For some instruments, no specific measurement of nonperformance risk (including credit risk) is required as the quoted prices of these instruments would be expected to incorporate the risk of nonperformance. In general, a reporting entity will not be required to separately measure nonperformance risk for assets and liabilities with observable prices in active markets. Such prices already reflect a market participant’s view of value, including credit risk, to the extent it is applicable. Instruments for which no credit risk adjustment is required include:

¹ Refer to paragraph 10 of FASB Interpretation No. 39, *Offsetting of Amounts Related to Certain Contracts – an interpretation of APB Opinion No. 10 and FASB Statement No. 105* (FIN 39), and FASB Staff Position FIN 39-1, *Amendment of FASB Interpretation No. 39* (FSP FIN 39-1), for a further description of master netting arrangements.

² Terms that appear in boldface type are defined in Appendix B.

- *Publicly traded equity securities* – Equity securities accounted for in accordance with FASB Statement No. 115, *Accounting for Certain Investments in Debt and Equity Securities* (FAS 115), typically will have observable prices in active markets (Level 1 fair value measurements). As equity represents the residual value in a company, credit risk per se is not measured. However, the market view of the company's potential cash flows, including credit risk, is inherent in the market price.
- *Some publicly traded debt* – The fair value of a reporting entity's public debt can generally be determined based on available market prices (which are generally Level 2 or Level 3 inputs, depending on the level of trading for a particular fixed income security). If quoted information is available for the same issue, no adjustment for credit risk is required.
- *Exchange-traded contracts* – The valuation of exchange-traded derivatives would typically be based on quoted prices for identical or similar instruments. Generally, exchanges will require the posting of margin or collateral in order to manage counterparty credit risk. For example, on the New York Mercantile Exchange (NYMEX), margin postings are required daily on futures contracts in order to mitigate the risk that the holder will not perform. The impact of those requirements is reflected in the quoted price. As a result, the valuation of a financial derivative contract traded on an exchange that requires a maintenance margin or another form of collateral arrangement likely would not require any adjustment for credit risk.

In cases where quoted prices are not available due to the lack of a liquid market for a particular instrument, the reporting entity should consider the risk of nonperformance, including credit risk, in developing its fair value measurement.

1.2.2 Timing

The credit risk adjustment should be reconsidered in each period in which fair value measurements are reported because the market view of credit risk will vary depending on the credit quality of the counterparties, the value of the underlying asset or liability, market volatility, and other factors that are dynamic. The following discussion highlights some of the questions that may arise in practice as reporting entities consider measurement of the credit risk adjustment:

Question 1-1: For assets and liabilities reported at fair value, is an evaluation of credit risk required each reporting period if there has been no change in credit rating since origination?

PwC Interpretive Response

Yes. A credit risk adjustment should reflect all changes in creditworthiness of the reporting entity or the counterparty, as applicable, which may not be reflected in their **credit ratings**. For example, a decline in the reporting entity's **credit default swap rate**, or an overall change in the **credit spreads** for the reporting entity's industry sector may indicate a higher cost of credit. Credit spreads and risk can change without a change in credit ratings. The credit risk adjustment should incorporate all available market information, including changes in the company's standing within its credit category, changes in the market price of credit or the market value of the asset or liability being measured, as well as other factors.

This concept is illustrated in FAS 157, paragraph A32, which states, in part:

On January 1, 2007, Entity A, an investment bank with a AA credit rating, issues a five-year fixed rate note to Entity B. The contractual principal amount to be paid by Entity A at maturity is linked to the S&P 500 index. No credit enhancements are issued in conjunction with or otherwise related to the contract (that is, no collateral is posted and there is no third-party guarantee). Entity A elects to account for the entire note at fair value in accordance with FASB Statement No. 155, *Accounting for Certain Hybrid Financial Instruments*. The fair value of the note (the obligation of Entity A) during 2007 is measured using an expected present value technique. Changes in fair value are discussed below ...

b. *Fair value at March 31, 2007.* During March 2007, the credit spread for AA corporate bonds widens, with no changes to the specific credit risk of Entity A. The expected cash flows used in the expected present value technique are discounted at the risk-free rate (using the treasury yield curve at March 31, 2007), plus the current market observable AA corporate bond spread to treasuries, adjusted for Entity A's specific credit risk (credit-adjusted risk-free rate). Entity A's specific credit risk is unchanged from initial recognition. Therefore, the fair value of the obligation of Entity A changes due to changes in credit spreads generally. Changes in credit spreads reflect current market participant assumptions about changes in nonperformance risk generally. (emphasis added)

As this example illustrates, a reporting entity is required to assess credit risk each period even if there is no change in the related credit rating because adjustments for credit are not triggered solely by a change in credit rating.

Question 1-2: If the original contract price included an adjustment for credit risk, does the reporting entity need to continue to evaluate the credit risk adjustment each period?

PwC Interpretive Response

Yes. The effect of nonperformance risk, including credit risk, is typically priced into the terms of a contract at inception but should be re-evaluated each reporting period. For example, credit risk may be incorporated into the pricing of a derivative instrument through an adjustment to the imputed interest rate, other pricing terms, or contractual credit enhancements (such as requirements to post collateral or letters of credit).

Similarly, credit risk is priced into long-term debt through the credit spread, which may vary depending on seniority of debt and other factors that impact credit risk. Because those terms are established as part of the contractual arrangement and dictate the contractual cash flows, some reporting entities have questioned whether an ongoing evaluation of credit risk is necessary in connection with the fair value measurement process at each reporting date.

Typically, commercial contract terms do not include provisions that reset pricing or cash flows due to changes in credit spreads or the credit standing of the issuing entity. As a result, credit risk should be reconsidered each period to incorporate contractual and market changes that may impact the credit risk measurement. Note that some contracts may require posting of additional

collateral or other credit enhancements for credit deterioration or other changes in fair value. This type of protection may impact the calculation of the credit risk adjustment but does not eliminate the requirement to re-evaluate the potential exposure to credit risk at each reporting date.

1.3 Market Participant Perspective

The measurement of credit risk should be based on market participant assumptions. FAS 157, paragraph 11, states:

The fair value of the asset or liability shall be determined based on the assumptions that market participants would use in pricing the asset or liability. In developing those assumptions, the reporting entity need not identify specific market participants. Rather, the reporting entity should identify characteristics that distinguish market participants generally, considering factors specific to (a) the asset or liability, (b) the principal (or most advantageous) market for the asset or liability, and (c) market participants with whom the reporting entity would transact in that market. (emphasis added)

Consistent with this guidance, credit risk should be measured based on market participant assumptions about the risk of default and how that risk will be valued. Market-based assumptions take priority over the reporting entity's point of view of its own credit risk or the credit risk associated with a specified counterparty. Accordingly, in calculating the credit risk adjustment, a reporting entity should consider all sources of information, available without undue cost or effort, that market participants would consider when determining how much they would pay to purchase an asset or require to be paid to assume a liability.

Available information can be adjusted and weighted based on facts and circumstances if the reporting entity believes it is not reflective of market conditions. This will require the use of professional judgment, which is a key element in fair value measurements. The rationale for the approach used for assessing credit risk and the basis for adjustments made in measuring fair value should be documented as part of the reporting entity's credit risk assessment.

1.4 Other Considerations

For many reporting entities, the typical approach for measuring credit risk is based on a point in time estimate: the reporting entity measures the credit risk associated with an asset or liability as of the measurement date. An alternative approach incorporates the expected exposure for a security or instrument over its term. This approach to measuring credit risk is broadly labeled the "potential exposure approach." The approach includes consideration of the future variability of the instrument's fair value based on underlying market movements. These potential future changes in fair value may impact a market participant's overall evaluation of credit risk associated with a particular instrument over its life or term.

Determination of credit risk using an expected exposure methodology may be based on potential market scenarios using a single or multiple set of assumptions. A market participant may measure credit risk based on the distribution of outcomes, at a point within the range of outcomes, or based on

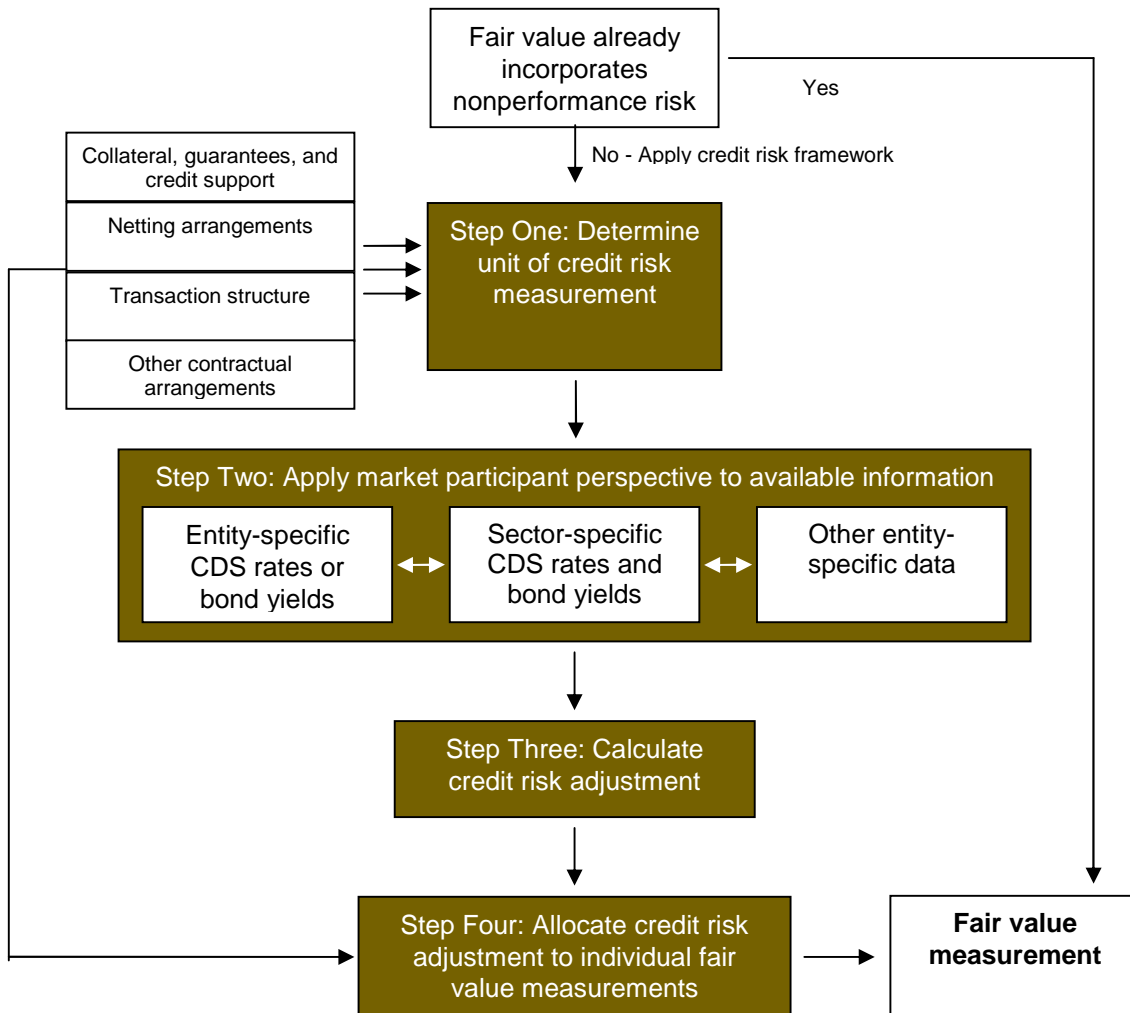
an expected maximum exposure calculated at a specified confidence level. The potential exposure approach is not widely used; however, reporting entities may increasingly need to incorporate this approach (and potentially other techniques) into the measurement of credit risk as markets continue to evolve.

Section 2: Credit Risk Measurement Framework

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2.1 Introduction to a Credit Risk Measurement Framework

There are many factors that may impact the measurement of credit risk including the nature of the instrument being measured (e.g., investment, debt, derivative), whether it is in an asset or liability position, and whether there are quoted prices available that already incorporate credit risk. This section discusses an overall framework that can be applied to assist in the calculation of a credit risk adjustment for a specific asset or liability. Key elements of the approach are depicted in the flowchart.



This section addresses application of the credit risk framework described above, and discusses specific implementation issues.

2.2 Step One: Determine Unit of Measurement for Credit Risk

As the first step in measuring credit risk, the reporting entity must determine the unit of measurement (i.e., what is being measured). In many cases, credit

risk will be measured based on a unit of account grouping that may differ from that used for the fair value measurement for an individual instrument.

For example, in measuring the fair value of a derivative instrument, the unit of account is the individual contract. However, multiple contracts may be grouped together in determining the credit risk adjustment to the extent the contracts are covered by a master netting arrangement. These factors add another consideration to the calculation and allocation of the credit risk adjustment.

The unit of account for purposes of determining the credit risk adjustment should incorporate all relevant factors including the profile of the asset or liability, its type (debt, derivative or warrant), terms (maturity date and par or notional amount), and other attributes (priority, recourse, and secured or non-secured status). In addition, credit enhancements, such as collateral-posting requirements, master netting arrangements, and parent company guarantees, and transaction structure should be considered.

Due to the potentially significant effect of these factors on the calculation of the credit risk adjustment, a reporting entity should ensure that it obtains a full understanding of its rights and obligations associated with a particular contract or counterparty prior to calculating the credit risk adjustment. Specific items that may affect the measurement include the following:

Collateral, Guarantees, and Credit Support

Requirements to post collateral, guarantees, letters of credit, and similar forms of credit enhancement may reduce the potential credit risk exposure. In addition to considering posted collateral, a reporting entity should ensure it has a comprehensive understanding of all credit support arrangements. For example, a provision in an investment agreement that requires the counterparty to post collateral if the counterparty's credit rating is downgraded will limit the reporting entity's potential exposure to loss and thus should be incorporated in the measurement of credit risk.

Master Netting Arrangements or Other Netting Agreements

A master netting arrangement generally provides that multiple derivative contracts with the same counterparty will be offset in the event of a default on any one of the contracts. The netting provisions result in a credit risk exposure based on the "net" position rather than at the individual contract level. Master netting arrangements may also incorporate other positions with the counterparty (e.g., non-derivative obligations and other forms of collateral) in the event of default.

Master netting arrangements or other agreements that allow for netting of assets and liabilities held with the same counterparty will change the potential risk exposure. For example, assume a company has contracts in both asset and liability positions with a particular counterparty. If the company has a master netting arrangement in place, it may calculate the credit exposure based on the net exposure of the asset and liability positions. However, absent such an arrangement, it would be required to separately calculate the exposure for assets and liabilities based on the market participant view of counterparty credit risk and its own credit risk, respectively.

In evaluating such arrangements, a reporting entity should consider whether the arrangement permits netting across contract types (e.g., interest rate swaps, different types of commodity contracts) or product type (e.g., physical versus cash settlement). The reporting entity should evaluate each legal entity it transacts with separately. In some cases, an arrangement may cover transactions with multiple subsidiaries of a specific company. However, in other instances, each subsidiary may be covered by a separate arrangement. The specifics of such agreements may have a significant impact on the reporting entity's exposure to loss and the calculation of the related credit risk adjustment.

Structural and Other Contract Considerations

A particular contract may incorporate other specific risks that may impact credit risk or the risk of nonperformance. For example, performance on a particular contract, such as delivery of an asset to a specific counterparty, may depend on receipt of an asset from another counterparty. In that case, the credit exposure on both contracts may be tied to performance by the party responsible for initial delivery. Any such contractual provisions should be considered in developing a credit risk adjustment.

2.2.1 Impact of Third Party Credit Enhancements

The Emerging Issues Task Force (EITF) recently addressed the accounting for inseparable third-party credit enhancements by the issuer of a liability in EITF Issue No. 08-5, *Issuer's Accounting for Liabilities Measured at Fair Value with a Third-Party Credit Enhancement* (EITF 08-5).

The EITF reached a consensus that the issuer of a liability with a third-party credit enhancement (such as a guarantee) should not include the effect of the credit enhancement in the fair value measurement of the liability. In accordance with this guidance, the credit risk adjustment for the liability would be calculated as though there were no third-party guarantee, letter of credit, or other form of credit enhancement. This guidance does not apply to credit enhancements provided by governmental entities or to arrangements between a parent and subsidiary, or between parties under common control.

Long-term debt and derivative instruments are frequently issued with a third-party guarantee or an underlying credit support arrangement. However, in accordance with the guidance in EITF 08-5, the issuer of the debt or derivative would ignore the credit enhancement in calculating its credit risk adjustment and would revert to its own stand-alone credit risk.

The guidance in EITF 08-5 does not apply to the holder of the instrument (e.g., the investor in a debt security or the counterparty to a derivative liability). Therefore, the counterparty would consider the benefit of any attached or inseparable third-party credit enhancements in measuring the fair value of the instrument (an asset to the holder).

The guidance in EITF 08-5 should be applied prospectively beginning in the first reporting period after December 15, 2008 (first quarter 2009 for calendar year-end companies). Early adoption is permitted. In accordance with the requirements of Securities and Exchange Commission (SEC) Staff Accounting Bulletin (SAB) No. 74, *Disclosure of the Impact That Recently Issued*

Accounting Standards Will Have on the Financial Statements of the Registrant When Adopted in a Future Period (SAB 74), public companies should disclose the impact of adopting this guidance in periodic filings made prior to adoption.

2.2.2 Determine Exposure to be Measured

After a reporting entity has identified and assessed all information that may impact the calculation of credit risk, it should calculate the net asset or liability exposure and determine whose credit needs to be measured. This information will be critical in the overall calculation of the credit risk adjustment. Following are specific examples of application of this guidance:

Example 2-1

Impact of Master Netting Arrangements on the Credit Risk Adjustment

As of December 31, 20X8, Company A has several derivative contracts with Counterparty X as follows:

Type of derivative	Amount	Asset / (Liability)
Interest rate swap	(\$ 20,000)	Liability
Interest rate swap	<u>10,000</u>	Asset
Total interest rate swaps	<u>(10,000)</u>	Net liability
Gas commodity contract	6,000	Asset
Gas commodity contract	5,000	Asset
Electricity commodity contract	8,000	Asset
Electricity commodity contract	<u>(12,000)</u>	Liability
Total commodity contracts	<u>7,000</u>	Net asset
Total of all contracts	<u>(\$ 3,000)</u>	Net liability

As these contracts are with the same counterparty, management initially considers whether it should measure credit risk associated with the net \$3,000 liability. However, in evaluating its netting and other arrangements with Counterparty X, Company A determines that it has a netting arrangement that covers the interest rate swaps and a separate master netting arrangement that affects all commodity derivatives, including both gas and electricity contracts. Accordingly, management determines that it should separately measure credit risk associated with the following:

- Interest rate swaps – Rights and obligations under these contracts are not eligible to be netted with those relating to the commodity derivatives. As of the reporting date, Company A would measure the credit risk for the net interest rate swap liability based on a market participant’s view of its own credit standing.
- Commodity contracts – All commodity contracts are covered by a single master netting arrangement. Company A should measure the credit risk

associated with the \$7,000 net asset based on a market participant's view of Counterparty X's credit.

This example illustrates how the form and substance of commercial agreements can impact the measurement of credit risk and will yield different credit risk adjustments. In this example, if there were no netting arrangements, Company A would calculate the credit risk adjustment separately for each of the derivatives. Alternatively, if all of the contracts were covered under a single master netting arrangement, credit risk would be calculated based on a net liability of \$3,000. However, because the swaps and commodity contracts are subject to separate netting arrangements, credit risk should be separately evaluated for the net swap exposure and for the net commodity exposure.

Example 2-2

Impact of Collateral and Credit Support on the Credit Risk Adjustment

This example has the same fact pattern as Example 2-1; however, Company A has received \$5,000 of cash collateral from Counterparty X.

Based on review of the underlying agreements, Company A determines that Counterparty X has posted collateral associated with the commodity contracts. Company A's net exposure is as follows:

Derivative type	Position	Collateral	Asset / (Liability)
Interest rate swap	(\$ 10,000)	\$ -	(\$ 10,000)
Commodity contracts	<u>7,000</u>	<u>(5,000)</u>	<u>2,000</u>
	<u>(\$ 3,000)</u>	<u>(\$ 5,000)</u>	<u>(\$ 8,000)</u>

As a result of the posted collateral, Company A has a net \$2,000 commodity derivative asset from Counterparty X, instead of the \$7,000 asset calculated in Example 2-1. Therefore, Company A should calculate the credit risk adjustment for the commodity contracts based on the net \$2,000 balance. The posted collateral has no impact on the calculation of the credit risk adjustment associated with the interest rate swap.

In this fact pattern, depending on the requirements of the underlying agreement, Counterparty X also may have been able to meet its collateral obligation by providing a parent company guarantee or a bank letter of credit. See discussion of the impact of such arrangements on the calculation of credit risk adjustments in Example 2-3.

Example 2-3

Impact of Credit Enhancements on the Credit Risk Adjustment

This example has the same fact pattern as Example 2-1; however, Company A's interest rate swaps are supported by a letter of credit issued by Bank B. In this fact pattern, Company A and Counterparty X should consider the potential credit exposure as follows:

Prior to Adoption of EITF 08-5

Prior to adoption of EITF 08-5, Company A could incorporate the benefit of the bank letter of credit in calculating the credit risk adjustment related to the interest rate swaps by considering the market participant perspective of its own credit and Bank B's credit. For example, when Bank B is viewed in the market as a stronger creditor than Company A, the credit support provided by Bank B would typically lower the required credit risk adjustment. In contrast, if the market viewed Company A more favorably than Bank B, the additional credit support may have limited impact on the credit risk adjustment, as a market participant primarily would be looking to Company A to satisfy the obligation.

Counterparty X would consider the combined creditworthiness of Bank B and Company A in determining the credit risk adjustment associated with the asset recorded on its books for the \$10,000 net interest rate swap.

After Adoption of EITF 08-5

In accordance with the requirements of EITF 08-5, the obligor (Company A) cannot consider the impact of a third-party credit enhancement in determining the credit risk adjustment. Therefore, after adoption of EITF 08-5, Company A will be required to measure the credit risk as of the reporting date based on a market participant's assessment of its own credit standing.

However, Counterparty X would still incorporate the impact of the credit enhancement in determining an appropriate credit risk adjustment for the interest rate swap asset recorded on its books. Adoption of EITF 08-5 by Counterparty X will have no impact on its approach to the calculation.

Example 2-4

Impact of Contracts Designated as Normal on the Credit Risk Adjustment

This example has the same fact pattern as Example 2-1, except that Company A also has one electricity contract with Counterparty X that qualifies, and has been designated as, a normal purchase in accordance with FASB Statement No. 133, *Accounting for Derivative Instruments and Hedging Activities* (FAS 133). As a result, the contract is accounted for as an executory contract and is not recorded at fair value in the financial statements.

The contract has a liability balance of \$5,000 as of December 31, 20X8. It is also subject to the overall commodity master netting arrangement between Company A and Counterparty X. Thus, a question arises as to whether the

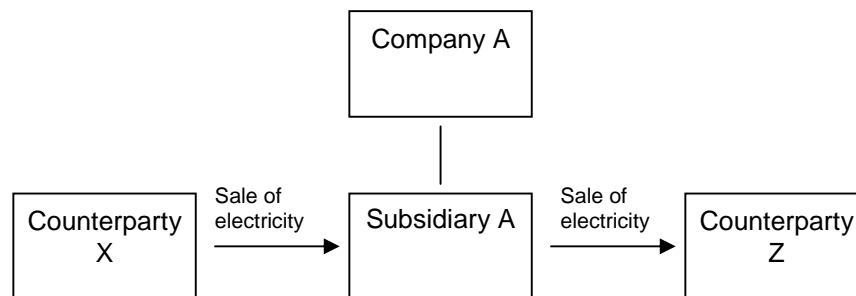
normal contract should be included in determining the credit risk adjustment. However, FAS 157 applies to derivatives recorded at fair value in the financial statements and the credit risk adjustment is intended to reflect the credit risk associated with recognized contracts in the fair value measurement. Therefore, contracts designated as normal purchases and normal sales, and other contracts that are not recorded at fair value on the balance sheet, should be excluded from the determination of the credit risk adjustment associated with a specific counterparty.

If a reporting entity has received collateral from a particular counterparty, it should consider whether any of the collateral relates to contracts designated as normal purchases and normal sales. If some of the collateral relates to such off-balance sheet contracts, the reporting entity should allocate the collateral between contracts recorded at fair value and those accounted for as executory contracts prior to calculation of the credit risk adjustment.

Example 2-5

Impact of Deal Structure on the Credit Risk Adjustment

In this example, one of Company A's subsidiaries enters into a structured transaction with Counterparty X and Counterparty Z, moving the in-the-money electricity commodity contract with Counterparty X (the \$8,000 commodity asset in Example 2-1 above), into a separate subsidiary. Subsidiary A is purchasing electricity from Counterparty X under this contract. Subsidiary A then enters into a power sales agreement with Counterparty Z. The structure of this transaction is as follows:



Performance on the Counterparty Z sales agreement is dependent on the receipt of the electricity from Counterparty X; Counterparty Z has no recourse to the overall assets of Company A if Subsidiary A fails to perform. Subsidiary A has no assets other than the purchase power contract with Counterparty X.

In this transaction, performance by Subsidiary A on the contract with Counterparty Z depends on the receipt of power from Counterparty X. Thus, if the contract with Counterparty Z is in a liability position, Company A should consider Counterparty X's credit standing in measuring credit risk, rather than solely considering its own credit risk. Company A would consider Counterparty Z's performance risk if the contract were in an overall asset position. In assessing the exposure attributable to Counterparty Z, Company A should also consider the impact of any collateral or other assets held by Subsidiary A.

2.3 Step Two: Apply a Market Participant Perspective to Available Credit Information

In measuring credit risk, a reporting entity should acquire and evaluate information about the probability of default and the cost of transferring the risk to another party. Information that a market participant may consider includes the following:

- Credit ratings and **historical default rates**
- Credit spreads
- Credit default swap rates
- Other public information with respect to a particular or similar entity.

This information may be entity-specific or pertain to a similar entity or particular industry sector. When evaluating the effect of credit risk on a fair value measurement, a reporting entity should consider current market conditions and whether the data it is using appropriately incorporates the most recent market trends. Some data sources may be more responsive to current conditions while other information may lag.

2.3.1 Evaluating Credit Information

Following is a summary of key considerations associated with the use of various sources of default information in calculating the credit risk adjustment.

2.3.1.1 Historical Default Rates and Recovery Data

Tables of historical default and related recovery rates are routinely available through ratings agencies (e.g., Standard & Poor's, Moody's) and in academic literature. Published default information is typically provided according to credit rating category (e.g., AAA, AA, A) and term (e.g., one year, five years, ten years).

Many reporting entities traditionally used historical default rates to measure credit risk for counterparties with a particular rating. However, reporting entities should understand the limitations of using this default data, without adjustment, when measuring credit risk for purposes of fair value measurement. Historical default information reflects loss information from a designated period in the past, which may not reflect current market developments. For example, if a reporting entity is developing credit risk adjustments for counterparties that are experiencing financial difficulty, historical default rates generally would not reflect current and emerging information. The fact that the data does not reflect current conditions may become an issue of increasing significance in periods of heightened economic fluctuation.

In addition, historical default rates may not sufficiently incorporate a market participant perspective about a specific entity. In measuring credit risk, market participants may make adjustments for market factors or a rate of profit, especially in periods of heightened market volatility, or for transactions involving counterparties that are not highly rated or that are experiencing

issues or uncertainty as reflected in their credit standing. Historical default rates do not incorporate this type of market-based risk adjustment.

As further described below, bond spreads or credit default swap rates may provide better indications of “market” rates for credit because they result from market participant pricing of credit risk for a specified instrument and counterparty.

2.3.1.2 Credit Spreads

A credit spread is the difference in yield between two similar debt instruments that is attributable to a difference in credit standing of the respective issuers of those debt instruments. Credit spreads are often quoted in relation to the yield on a credit risk-free benchmark security (e.g., U.S. Treasury bonds) or reference rate (e.g., U.S. Treasury rates or LIBOR rates). A credit spread for a public company is based on the issuer's publicly traded unsecured debt or by reference to a debt instrument with similar terms and for which credit exposure is considered to be substantially similar. Credit spread information may be obtained from a financial information network, such as Bloomberg, or other debt pricing and quotation sources.

Compared to using unadjusted historical default rates, credit spreads may provide more current information about a market participant's view of the credit risk of a particular counterparty and is often a better reflection of a market participant perspective. However, there are limitations on the use of this information as a credit spread is specific to the debt instrument to which it relates, including its size, seniority, tenor, and other terms, and to the instrument's issuer. Furthermore, credit spreads may not reflect current market information as quickly as a credit default swap rate (discussed below).

Publicly quoted credit spreads generally are not available for private companies. When company-specific spreads are not available, it may be appropriate to consider credit spreads on publicly traded debt of a similar entity as an input in calculating the credit risk adjustment.

2.3.1.3 Credit Default Swap Rates

A credit default swap (CDS) is a swap contract in which one company (the buyer of credit protection) makes a series of payments to another company (the seller) and, in exchange, receives a payoff if a referenced issuer of a debt instrument defaults or on the occurrence of a specified credit event (such as bankruptcy or restructuring).

A CDS rate refers to the current market rate for the series of payments to the seller of credit protection. The cost of credit as expressed by a CDS rate is generally the annual rate multiplied by the amount of the reference credit obligation, discounted at LIBOR. A CDS can be cash-settled or physically-settled by delivery of the underlying instrument in exchange for payment of the contractual amount.

A CDS resembles an insurance policy in the sense that it can be used by the debt holder to hedge against the risk of loss caused by a default on a specific debt instrument. Unlike an insurance policy, however, the company that purchases the credit protection is not required to actually hold an asset or be

at risk for loss. CDS rates are generally the most current information about a market participant's point of view of an issuer's credit.

CDS rates can be obtained from financial information services (e.g., Bloomberg) or may be estimated based on appropriate pricing inputs. CDS rates may be quoted for reference securities of different maturities and should be adjusted to match the length or term of the exposure. Various methods, including interpolation, may be used to adjust the CDS information to the appropriate tenor. Reporting entities should ensure that methodologies are consistently applied.

Question 2-1: There is some CDS information available but it is for CDS contracts that are thinly traded and whose prices are volatile. Should this information still be considered in the calculation of credit risk?

PwC Interpretive Response

Yes, all reasonably available market information should be considered in the calculation of a credit risk adjustment.

The CDS market is large (\$62 trillion in notional value as of fall 2008) and rapidly incorporates current market information in comparison to credit ratings or credit spreads. For example, while Lehman Brothers had an investment grade credit rating the Friday before it declared bankruptcy, the cost for obtaining credit protection on Lehman Brothers debt using a CDS was increasingly more costly over the period leading up to this event.

However, the CDS market is not currently regulated and there may be a lack of transparency regarding certain CDS information. In addition, the market is dominated by a few large financial institutions and some CDS contracts are thinly traded (or may not be traded) and experience significant volatility. Therefore, questions have been raised about the use of unadjusted CDS information in incorporating credit risk in some fair value measurements.

FAS 157, paragraph 30, addresses the information that should be considered in a fair value measurement as follows:

... In developing unobservable inputs, the reporting entity need not undertake all possible efforts to obtain information about market participant assumptions. However, the reporting entity shall not ignore information about market participant assumptions that is reasonably available without undue cost and effort.

This excerpt is part of an overall discussion about the use of unobservable inputs in a fair value measurement. It also provides useful guidance in assessing what information should be incorporated in a fair value measurement. This guidance emphasizes that reasonably available market information should not be ignored. This concept is further discussed in FSP FAS 157-3. Although FSP FAS 157-3 focuses on developing an overall fair value measurement for a financial asset that is not actively traded, it reiterates the priority of market information in a fair value measurement. Paragraph 9 of FSP FAS 157-3 discusses existing principles of FAS 157:

Even in times of market dislocation, it is not appropriate to conclude that all market activity represents forced liquidations or distressed sales. However, it is also not appropriate to automatically conclude that any transaction price is determinative of fair value. ... In determining fair value for a financial asset, the use of a reporting entity's own assumptions about future cash flows and appropriately risk-adjusted discount rates is acceptable when relevant observable inputs are not available.

FSP FAS 157-3 provides indicators of when observable inputs may not be relevant or may require significant adjustment including:

... in cases where the volume and level of trading activity in the asset have declined significantly, the available prices vary significantly over time or among market participants, or the prices are not current ...

In addition, FSP FAS 157-3 provides an example of an approach to a fair value measurement that includes available market information and the entity's own assumptions. This example demonstrates specific considerations in incorporating various sources of information in the fair value measurement. As demonstrated in the example, market information obtained from inactive markets still provides a point of reference in the estimation of fair value. Therefore, in assessing the use of a CDS rate, it is appropriate for the reporting entity to consider the source of the information, the liquidity of the market, and other factors.

When determining the appropriate credit risk adjustment, a reporting entity should not disregard or ignore CDS rates or other inputs that provide information about the market participants' perspective. Identifying all relevant sources of information, evaluating the accuracy of the information, and weighing the relative merits of all available data is a difficult and judgmental process. A reporting entity should prepare documentation of the information considered and the basis for its conclusions.

2.3.2 Comparing Sources of Credit Information

The following table highlights certain advantages and disadvantages associated with incorporating the various indicators of potential default into a credit calculation:

Figure 2-1
Comparing Credit Information

Method	Advantages	Disadvantages
Historical default rates	<ul style="list-style-type: none"> • Default information provides an indication of risk and is widely available • Cumulative historical default rates are routinely published by a variety of sources 	<ul style="list-style-type: none"> • Historical rates may not be indicative of the current market environment or future conditions • Lag market events • Do not reflect entity-specific information

Method	Advantages	Disadvantages
Bond prices and yields (credit spreads)	<ul style="list-style-type: none"> • Bond prices can be obtained for any publicly traded debt instrument • Provide a current market view of credit risk 	<ul style="list-style-type: none"> • May be difficult to apply if publicly traded instruments are not available • Tend to be less responsive to current market events than CDS rates
Credit default swaps	<ul style="list-style-type: none"> • Current market view of credit risk associated with a specific entity • CDS rates related to a particular industry segment may also be useful in assessing risk 	<ul style="list-style-type: none"> • CDS rates may be thinly traded and volatile • CDS rates are not available for all companies • Only available for the short end of the interest rate curve

In evaluating available information, reporting entities should also consider the fair value hierarchy. In determining the fair value of an asset or liability, observable inputs should be prioritized over unobservable inputs. As described in FSP FAS 157-3, observable information may not always be available, or unobservable data may be more appropriate in certain circumstances. However, if observable inputs are reasonably available, those inputs cannot be ignored and should be appropriately weighed in the measurement.

Question 2-2: Is use of historical default information to measure credit risk sufficient?

PwC Interpretive Response

In many industries, prior practice has been to incorporate credit risk based on the credit rating of the counterparty (for an asset) or reporting entity (for a liability) and on corresponding historical default rates. However, FAS 157 requires that the measurement of fair value incorporate a market participant's perspective of nonperformance risk, including credit risk. Historical default information is generally not entity specific and may not be reflective of current or expected future market conditions. Bond yields and CDS rates provide a more current market view of credit risk associated with a specific entity.

To the extent that entity-specific bond yields or CDS rates are not available, industry sector credit information generally will be a more reliable indication of the market view of risk of default than historical default rates alone. Accordingly, solely using historical default information to measure credit risk is generally not sufficient and such information often should be adjusted by incorporating other market data.

Question 2-3: A reporting entity's risk management group has developed a certain methodology for considering counterparty credit risk. Is the reporting entity required to use the same methodology for purposes of measuring fair value for financial reporting?

PwC Interpretive Response

Many reporting entities have implemented risk management processes that manage counterparty exposure by developing lists of approved counterparties, establishing limits for exposures with a particular counterparty, determining the level of collateral or other credit support required for each counterparty or type of counterparty, and other related criteria.

In many cases, the approach to managing credit exposure developed by the risk management group will reflect the overall approach to measuring credit risk used by other market participants. Therefore, a reporting entity's methodology for measuring credit risk for financial reporting purposes should include consideration of information used by its risk management group. If the internal process uses information consistent with market participant assumptions, it may be used as an input when measuring fair value. In all cases, the determination of credit risk adjustments should reflect market participant assumptions and not management assumptions developed by the reporting entity.

2.3.3 Other Considerations

Each company will have unique characteristics and often differing levels of reasonably available market information. For example, a large financial services institution may have a credit rating, multiple tranches of publicly traded debt, quoted credit default swap rates with multiple tenors, and other public information, which may provide strong evidence of a market participant's assumptions about credit risk. In contrast, a privately-held company may have limited public information reasonably available for consideration of the appropriate credit risk adjustment.

To the extent that little or no entity-specific information is available, it may be helpful to consider credit default swap benchmarks or other credit benchmarks for the industry. Sector information may also be useful as another benchmark in evaluating counterparties when there is public information available.

When sector information is used in lieu of or to supplement entity-specific information, the reporting entity should adjust the information to align it with the unique characteristics of the asset or liability for which credit risk is being measured. For example, if the average credit rating for the industry is A but a reporting entity is measuring an instrument issued by a counterparty with a credit rating of BBB, the difference in credit rating would suggest a need to incorporate a higher degree of credit risk in the measurement than suggested by the industry benchmark.

2.3.4 Approaches to Assessing Available Information

The following examples demonstrate approaches to considering and weighting various types of information:

Example 2-6

Using Company-Specific Market Information

In September 20X8, Company B, a gas distribution company, enters into a two-year pay-fixed and receive-floating gas swap with Counterparty M, a gas marketer, based on the NYMEX Henry Hub monthly index. The swap meets the definition of a derivative and Company B will record it at fair value with changes to fair value reported in the income statement each reporting period. The swap is not subject to a master netting arrangement and no collateral has been posted. As of December 31, 20X8, the fair value of the swap, without any adjustment for credit risk, is a liability of \$365,000.

Since the contract is in a liability position, the credit adjustment will be based on market participant assumptions about Company B's credit risk (i.e., the amount market participants would require for assumption of this liability in a transfer). Company B assesses the available credit information as follows:

- **Credit rating** – Company B's credit rating on September 30, 20X8 was BBB, which is generally consistent with comparable companies in the industry. Based on this credit rating, Company B noted that the historical default tables indicate a default rate of less than 0.6% over the term of the swap contract. However, the use of the historical default rate method is unlikely to provide a current market participant's assumption about credit risk. Because Company B is not at least AA rated, market participants would likely consider other market indicators in assessing credit risk.
- **Credit spreads** – Company B's publicly traded, unsecured debt was trading with yields in the range of 1.4%-1.7% over U.S. Treasury bonds as of December 31, 20X8. Company B considered the use of this information in the calculation of the credit risk adjustment; however, it determined that CDS rates are available and more appropriate to the derivative being measured. In addition, given the currently volatile credit markets, Company B determines that CDS rates provide a more timely and reliable indicator of credit risk.
- **Credit default swaps** – There are publicly quoted CDS rates available for Company B, with current activity through December 31, 20X8. Company B is able to obtain CDS rates from an information service without undue cost or delay. The CDS rate is approximately 273 basis points for the first year of the contract, decreasing to 258 basis points for the second year. The spreads have been increasingly volatile. Company B incorporates CDS rates in its assessment of counterparty credit risk for its risk management purposes.

Company B's perspective is that the risk of default is minimal and would be consistent with the risk indicated by historical default rates. In addition, Company B is concerned about the high level of volatility and thin trading associated with CDS rates. However, it determines that CDS rates provide the best indicator with respect to the current market view of its risk of default as of the reporting date. Accordingly, based on the reasonably available information, Company B concludes that using the CDS rate provides the best estimate of credit risk from the market participant perspective.

Example 2-7

Weighting Market Information

This example has the same fact pattern as Example 2-6, except that there are no quoted CDS rates available for Company B. There is CDS information available for the gas distribution sector. The CDS sector rate was approximately 250 basis points for the first year of the contract, decreasing to 225 basis points for the second year. Recent CDS quotes have been volatile.

Based on the available information, Company B concludes that it should calculate credit risk by weighting company-specific credit spreads and the sector-specific CDS rates. Management determines that the credit spreads provides the best company-specific information about potential risk of default. However, it also concludes that the CDS rates are more reflective of the current market participant perspective of credit risk. Because there are positive factors supporting each of these approaches, Company B believes that weighting the information is appropriate. Company B uses an equal weighting for each of the factors because it determined that there is no clear indication of which factor would be more heavily weighted by a market participant.

Example 2-8

Evaluating Various Types of Market Information

Company B is valuing \$1.0 million in preferred stock that was issued to private investors. This stock is classified as debt on the balance sheet because it is mandatorily redeemable. Company B is required to calculate the fair value of the preferred stock for purposes of the fair value disclosures required by FASB Statement No. 107, *Disclosures of Fair Value of Financial Instruments*. In considering the valuation process, management observes that:

- Market conditions for debt have deteriorated
- Its sector has been affected by a number of negative factors
- There has been generally widening of credit spreads.

Company B's management believes that the company tends to follow industry trends with a slight "positive" factor due to a lower than average debt-to-equity ratio. Company B's management also obtains the following inputs for consideration:

- The credit spread on Company B's public debt is 3%.
- The public debt is senior to the preferred stock. Due to current credit conditions and Company B's lower than average risk of default, Company B's management believes that an adjustment of 1% is required to reflect the lower seniority of the preferred stock in relation to the public debt. Therefore, the implied credit spread for the preferred stock is 4%.
- Company B is able to obtain a quote for Company H's preferred stock that has similar terms and characteristics. The current credit spread implied in this issuance is 4%. Company H has the same credit rating as Company B;

however, Company B operates in an industry that has a lower risk profile. Furthermore, Company H trades at a higher price in its credit category than Company B. Management determines that the difference in sectors and position within its credit category require an upward adjustment of .5%. Therefore, the credit spread implied by these inputs is 4.5%.

- Management obtains a quote for a publicly traded series of subordinated debt for Company J, a company within Company B's sector with a credit rating a grade below Company B's. The debt has characteristics (e.g., subordination, covenants, and other terms) that are similar to, though not exactly the same as, Company B's preferred stock. In addition, Company J has covenants that include restrictions beyond those imposed with Company B's preferred stock. The credit spread on the debt is 6% at the reporting date. Given the additional restrictions and the lower credit quality of Company J, management adjusts the credit spread downward by 1.25%, for an implied spread of 4.75%.

Company B considers the three reference inputs which, as adjusted, range from a low of 4.0%, a mid-point of 4.5%, to a high of 4.75%. In assessing the appropriate rate to apply in calculating the credit risk adjustment, management considers the quality of the data sources. It notes that the first price is considered to be the most relevant as it starts with Company B's own debt and adjusts for the risk in the preferred stock. However, the second two inputs reference subordinated debt, which is a better comparison to the subordinated position of the preferred stock. Because the credit markets place a premium on seniority, and because Company B operates in a higher risk sector, management has determined that the weighting should be closer to the subordinated debt spreads and assigns a credit spread of 4.5%.

2.4 Step Three: Calculate the Credit Risk Adjustment

There are various methodologies to calculate the credit risk adjustment and to incorporate the adjustment into the measurement of fair value. There is some flexibility in the method selected; however, management should apply a consistent method when performing similar measurements. In addition, a reporting entity must consider all relevant valuation approaches that would be used by a market participant, for which inputs can be obtained without undue effort.

FAS 157 describes three main approaches to measuring the fair value of assets and liabilities:

- Cost approach
- Market approach
- Income approach

In some cases, such as an exchange-traded commodity contract or a marketable debt security, an approach to valuation based on the quoted market price will incorporate nonperformance risk (including credit risk). However, when quoted prices are not available or do not include a credit risk component, other approaches to valuation may be used.

In determining the appropriate methodology to calculate the credit risk adjustment, the reporting entity should consider how a market participant would be expected to approach the calculation. Market approaches may evolve over time and reporting entities should continue to assess their approaches to ensure consistency with current market participant approaches and assumptions. Methods that may be used in the calculation of the credit adjustment include the following:

- Market Approach – Prices in traded markets will generally incorporate credit risk. If pricing inputs require adjustment for credit risk, information such as CDS rates and credit spreads should be evaluated to determine an appropriate adjustment.
- Income Approach – When using the income approach, credit risk may be incorporated into the discount rate, the undiscounted expected cash flows, or the discounted cash flows. These methods are described in Appendix B of FAS 157. Credit spreads are often incorporated into the discount rate. CDS rates can be included in several ways including the following:
 - Discount rate adjustment technique – The reporting entity will use the available inputs (CDS rates, bond spreads) to calculate the credit risk adjustment. The credit inputs may be used to directly adjust the discount rate used in the overall fair value calculation (i.e., the reporting entity may add the CDS rate or bond yield to the risk free rate). Alternatively, the reporting entity may calculate the credit risk adjustment by applying the CDS rate to the future cash flows.
 - Exponential CDS default method – This method takes the CDS rate and extracts from it the implied risk of default which is then applied to the market value of the unit of measurement and reduced by expected recoveries. A quoted CDS spread may be converted to a risk of default using the following formula:

$$\text{Probability of default (PD)} = \text{CDS rate} / (1 - \text{recovery rate})$$

Recovery rates are available from published sources depending on the credit rating of the company; however, historically, a 40% rate for secured debt and 34% for unsecured debt were common assumptions. The reporting entity should assess the probability of default implied in the CDS credit rating of its counterparty as part of this calculation.

The application of these methods is demonstrated in Section 3.

2.5 Step Four: Allocate the Credit Risk Adjustment to Individual Fair Value Measurements

After the reporting entity has determined the appropriate credit risk adjustment, the amount should be appropriately classified and disclosed. This process is relatively straightforward where the unit of measurement for the credit risk adjustment is the same as the unit of account for the overall fair value measurement (such as a standalone derivative contract). In that case, the credit risk adjustment is calculated at an individual transaction-level. The credit risk adjustment will be incorporated into the fair value measurement of that related instrument on the balance sheet, statement of income or other comprehensive income, and in the fair value disclosures.

However, where the unit of measurement for the credit risk adjustment differs from the unit of account used for the overall measurement of fair value, an allocation of the credit risk adjustment is required. For example, the unit of account for the fair value measurement may be on an individual contract basis but the credit risk adjustment may be calculated on a net basis if the contracts are subject to a master netting arrangement. For these measurements, reporting entities may be required to allocate the credit risk adjustment among the various individual contracts.

There may be specific challenges in allocating credit risk adjustments among items classified as short- and long-term, assets and liabilities, net income and other comprehensive income, and among items split in the three-level fair value hierarchy disclosures. In addition, allocation of credit risk adjustments measured at the portfolio level may be required to comply with FASB Statement No. 161, *Disclosures about Derivative Instruments and Hedging Activities, an amendment of FASB Statement No. 133* (FAS 161). FAS 161 requires derivatives to be disclosed on a gross, transaction-level basis. Accordingly, the credit risk adjustment may need to be allocated to the individual derivative level.

2.5.1 Allocation Methods

The question of how to allocate a portfolio level credit risk adjustment to individual contracts arose during the first quarter of adoption of FAS 157. Several different allocation methods were discussed with the SEC and FASB staffs. Any one of these methods is acceptable when appropriate in the circumstances and consistently applied. Other methods also may be used as long as a reporting entity can support that the method is appropriate for its fact pattern. Some of the potential allocation methods are further described below. Each of the methods assumes that the reporting entity calculates a net credit risk adjustment for all derivative positions with a specific counterparty with which the reporting entity has a master netting arrangement.

Relative Fair Value Approach

Under the relative fair value approach, the reporting entity will calculate the portfolio level credit risk adjustment based on the net position with a specific counterparty (i.e., incorporating the netting permitted under a netting arrangement). In practice, we have observed two different methods used to allocate the net adjustment. In one method, the reporting entity will allocate a portion of the portfolio level credit risk adjustment to each individual derivative asset and liability with that counterparty. This approach results in recording the portfolio level credit risk adjustment to both the individual assets and liabilities, based on the relative fair value of the individual derivative to the net position with the counterparty.

Under another acceptable method, the credit risk adjustment on the net position is allocated to all individual contracts in the same position as the net position based on their relative fair values. For example, if a reporting entity was in a net liability position with a specific counterparty, the credit risk adjustment would only be allocated to the liability positions with that counterparty that are subject to the netting arrangement. Asset positions would not reflect a credit risk adjustment.

Relative Credit Adjustment Approach

Under the relative credit adjustment approach, the reporting entity allocates a portion of the portfolio level credit risk adjustment (calculated on the net position) to each derivative asset and liability based on the relative credit risk adjustment of each of the derivative instruments in the portfolio. This approach will allocate the portfolio credit risk adjustment to each instrument based on the derivation of a credit risk adjustment for each position on a stand-alone basis, similar to the in-exchange approach described below.

In order to apply a relative credit adjustment approach, the reporting entity will need to calculate the credit risk adjustment on a net and gross basis (i.e., considering a master netting arrangement in one calculation and ignoring it in another). Both calculations are required because in order to mechanically perform a calculation on a relative value basis, a derivative's individual credit adjustment is needed to compare it to the net credit risk adjustment of the portfolio.

Marginal Contribution Approach

Under the marginal contribution approach, the reporting entity allocates a portion of the portfolio level credit risk adjustment to each derivative asset and liability based on the marginal amount that each derivative asset or liability contributes to the portfolio level credit risk adjustment.

The marginal approach is a "build-up" approach. The reporting entity starts with a single position and allocates the net credit risk adjustment. The next position is selected and the next allocation is performed. This process continues on an iterative basis. The allocations may differ based on which order of derivatives an entity selects. This method is not generally used in practice and has not been further illustrated in the examples included in Section 3.

In-exchange or "Full Credit" Approach

The in-exchange method uses the derivative's stand-alone fair value in the calculation of the credit risk adjustment, ignoring the effect of any master netting arrangements. The benefit of this model is that it avoids the complexity of any allocation process. The result assumes the designated derivative is the only derivative with the counterparty, and it complies with the principle in FAS 133. The downside is that this method may over- or under-state the actual credit risk exposure based on the terms of the master netting arrangement and the credit quality of the reporting entity and the counterparty.

The method selected should be consistently applied and clearly disclosed. An example of the application of these techniques is included in Section 3.

Question 2-4: Can the credit risk adjustment impact the classification in the fair value hierarchy?

PwC Interpretive Response

Yes. Consistent with the requirements of FAS 157, credit risk should be determined and incorporated into a fair value measurement based on how a

market participant would price the risk into the measurement. To the extent that the credit risk adjustment is significant, it may impact the overall classification of the measurement in the fair value hierarchy.

Different sources of information may be used to determine an adjustment for credit risk, including CDS rates, credit spreads, and historical default rates. CDS quotes and credit spreads may be considered observable if they are directly observable or derived from market observable data. However, reporting entities should use caution when obtaining a quote for a CDS or credit spread that is indirect (i.e., for a similar entity) or one that is indicative. The quotes should be assessed to determine how closely they match the CDS price or credit spread for the actual asset or liability, and may require an adjustment to ensure they appropriately reflect market participant assumptions. Finally, historical default rates generally are not considered to be market-based given the lag in incorporating market trends.

The type and source of data that is used to determine the credit risk adjustment will have an impact on how the valuation is classified in the fair value hierarchy. In determining whether the credit risk adjustment is observable or not, reporting entities need to consider what information is being used by market participants to price credit.

**Section 3:
Calculation and Allocation of Credit Risk
Adjustments**

Section 3: Calculation and Allocation of Credit Risk Adjustments

3.1 Calculation of a Credit Risk Adjustment

Reporting entities may use different methods for the calculation of the credit risk adjustment. In the examples below, we illustrate various methods of using credit spreads and CDS rates to estimate the credit risk adjustment. The format for calculation varies in each example to illustrate different formats in which the credit information may be received and different methods of calculation. Following is a brief description of the methods used:

- Example 3-1: Discount rate adjustment technique – In this example, the reporting entity calculates the credit risk adjustment by applying the CDS rate directly to the cash flows in each period. The reporting entity calculates the net credit risk adjustment by calculating the present value of the credit risk exposure based on the risk free rate.
- Example 3-2: Exponential CDS default method – The exponential CDS default formula is used to apply an average default rate to the credit risk exposure over the term of the obligation. This method may be used when a CDS rate is quoted for a term and year by year rate information is not available. The implied risk of default is then applied to the market value of the unit of measurement and reduced by expected recoveries
- Example 3-3: Discount rate adjustment technique – This calculation is similar to Example 3-1; however, the calculation is performed using credit spread information applied to the cumulative exposure.
- Example 3-4: Discount rate adjustment technique – This example also demonstrates the use of discount rate adjustment techniques, comparing results obtained by using CDS rates and credit spreads.

See further discussion in the examples below.

Example 3-1

Discount Rate Adjustment Technique – Using a CDS Rate

Company C holds an interest rate swap with Counterparty S. Under the terms of the swap, Company C pays 7% in exchange for receiving three-month LIBOR plus 1% (5% at September 30, 20X8). The swap has a three year remaining term until maturity. The swap meets the definition of a derivative and Company C records it at fair value with changes recognized in earnings each reporting period. The swap is not subject to a master netting arrangement and no collateral has been posted.

As of September 30, 20X8, the fair value of the swap, without any adjustment for credit risk, is a liability of \$1,000,000. For purposes of this example, assume that the liability will be paid in equal installments at the end of years 1 through 3. As the contract is in a liability position, the credit risk adjustment will be based on market participant assumptions, such as Company C's risk of default, liquidity of credit and other factors (i.e., based on the amount market participants would require for assumption of this liability in a transfer).

Company C assesses the available credit information and determines that market participants would price credit based on Company C's CDS rate, which is available by reference to a number of pricing services. The credit risk adjustment is calculated as follows:

Year	Balance	CDS quote		Credit Risk	Discounted
	Outstanding	in basis points	%	Adjustment	Credit Risk Adjustment
	(a)	(b)	(c) = (b) / 10,000	(d) = (a)*(c)	(e) = NPV(.05,(d))
One	\$ 1,000,000	38	.38%	\$ 3,800	\$ 3,619
Two	666,666	45	.45%	3,000	2,721
Three	333,333	60	.60%	<u>2,000</u>	<u>1,728</u>
				<u>\$ 8,800</u>	<u>\$ 8,068</u>

The credit risk adjusted cash flows (column (d) in the table above) are discounted at the risk-free rate to determine the credit risk adjustment as of the reporting date (column (e) in the table). The risk-free rate is assumed to be 5% for purposes of this example.

Based on the calculation, Company C should record a credit risk adjustment of \$8,068. Therefore, as of September 30, 20X8, Company C reports a net derivative liability of \$991,932 related to the interest rate swap. The impact of the credit risk adjustment should be included in the fair value change for the derivative recorded in the income statement.

Example 3-2

Exponential Default Method – Using a CDS Rate

This example has the same fact pattern as Example 3-1 above; however, Company C has adopted the use of the exponential CDS default method. This method also provides a means for measuring an estimated “survival” rate which is sensitive to and declines in correlation with the length of time an instrument is outstanding.

Company C obtains a three year CDS rate at 40 basis points (0.4%). There are no other CDS quotes available. Consistent with the information presented in the table in Example 3-1, Company C determines that the average outstanding balance over the term will be approximately \$666,000. In addition, Company C assumes a recovery rate of 35%, based on its expectation of market participant assumptions.

Based on this information, Company C calculates a probability of default as follows:

$$\text{Probability of default (PD)} = \text{CDS rate} / (1 - \text{recovery rate}) * \text{term}$$

$$\text{Probability of recovery (PR)} = 35\%$$

$$\text{PD} = 0.4\% / (1 - 35\%) * 3$$

$$\text{PD} = .018462$$

$$\text{Credit risk adjustment} = \text{fair value} * \text{PD} * (1 - \text{PR})$$

$$\text{Credit risk adjustment} = \$666,000 * .018462 * (1-.35)$$

$$\text{Credit risk adjustment} = \$7,992$$

In this example the exponential default method results in a slightly different recognition of credit risk as compared to the discount rate adjustment technique illustrated in Example 3-1.

An extension of this methodology provides for the calculation of fair value adjusted for the risk of nonperformance assumed by the holder. This risk adjusted fair value is calculated using the following formula:

$$\text{Survival Rate (SR)} = 2.718281828^{\text{PD} * \text{term}}$$

2.718281828 = natural number for exponential equation

$$\text{SR} = 2.718281828^{(-.018462) * 3}$$

$$\text{SR} = .946121$$

Note that the exponential computation requires the expression of the probability of default (.018462) as a negative number in the formula.

In this example, the risk free fair value is calculated as follows:

$$\text{Fair value} = (\text{Present value of expected cash flows} * \text{SR} * (1 - \text{recovery rate})) + (\text{Present fair value of expected cash flows} * \text{recovery rate})$$

$$\text{Fair value} = (\$666,000 * .946121 * (1-.35)) + (\$666,000 * .35)$$

$$\text{Fair value} = \$642,676$$

This method provides for a discount of \$23,324 which is higher than either of the other methods demonstrated and incorporates an element of profit for assuming the risk of nonperformance.

Example 3-3

Discount Rate Adjustment Technique – Using a Credit Spread

The following example demonstrates the calculation of the credit risk adjustment for the preferred stock discussed in Example 2-8. The preferred stock is mandatorily redeemable at its par value of \$1.0 million in 5 years. The preferred stock provides for 20 quarterly dividend payments of \$17,500, based on an annual rate of 7%.

The preferred stock rates are comprised of the following:

	Issuance Date	Measurement Date
LIBOR rate	4.00%	5.00%
Credit spread	3.00%	4.00%
	7.00%	9.00%

The credit risk adjustment may be calculated as follows:

Calculation of total fair value

Present value of redemption payment at the end of 5 years, discounted at 9.0%		\$ 649,931
Present value of 20 quarterly dividend payments, discounted at 9.0%		<u>279,365</u>
Fair value of the preferred stock at the measurement date		<u>\$ 929,296</u>

Components of change in fair value

Change attributable to changes in interest rates	<i>LIBOR rate increase of 1%</i>	\$ 28,282
Change attributable to changes in credit risk	<i>Credit spread increase of 1.5%</i>	<u>42,422</u>
Total change in fair value	<i>\$1,000,000 par, minus fair value 929,296</i>	<u>\$ 70,704</u>

In this example, the credit risk adjustment was calculated as part of the discount rate applied in the overall calculation of fair value.

Example 3-4

Discount Rate Adjustment Technique — Impact of Different Credit Sources

The following example demonstrates the impact of using different information sources in the calculation of the credit risk adjustment for the natural gas swap discussed in Example 2-6.

Key terms of the contract are as follows:

- Company B will pay the Henry Hub Monthly Index as published by Inside FERC (trade publication) and will receive \$14.00 per MMBtu.
- The contract term is from October 1, 20X8 through September 30, 20X0.
- The daily notional volume is 10,000 MMBtus.
- The swap is not subject to a master netting arrangement and no collateral has been posted.

As of December 31, 20X8, the fair value of the swap, without any adjustment for credit risk, is a liability of \$365,000. As the contract is in a liability position, the credit risk adjustment will be based on market participant assumptions about Company B's risk of default (i.e., the amount market participants would require to assume this liability).

Company B has a BBB credit rating and determines that the following credit information is available:

	Historical default rates	Credit spread	CDS rates
One year	0.23%	1.74%	2.74%
Two year	0.54%	1.89%	2.58%

Company B determines that the historical default rates are not reflective of market participant assumptions about its risk of default and does not further evaluate this information.

Company B determines that a market participant would calculate fair value by applying a discounted cash flow technique (based on the differential between the forward gas curve and the fixed amount per MMBtu under the contract). The risk adjusted rate to be used in the calculation could be determined by adding either the CDS rate or the credit spread to the risk free rate, depending on which one of the two rates (or combination of the two rates) best represents a market participant's assumptions about credit risk. The potential outcomes vary depending on the adjustment used. The use of the CDS rate would result in a credit risk adjustment of \$11,724 compared to a credit risk adjustment of \$8,598 using the ratings spread. The reason for the difference in these amounts is that the credit spreads are lower than the CDS rates which, when discounted, results in a lower credit risk premium.

3.2 Allocation of Portfolio Level Credit Adjustment

Reporting entities may be required to allocate the credit value adjustment to the individual derivative for purposes of hedge accounting, balance sheet and income statement presentation, and disclosures. This section includes examples illustrating the application of various allocation methods.

Example 3-5

Application of Credit Allocation Methods

Assume that Company E holds three derivative positions with Counterparty Q as of the reporting date. The fair values prior to any credit adjustment are as follows:

Derivative	Amount	Classification
Derivative 1	(\$ 1,000)	Liability
Derivative 2	1,500	Asset
Derivative 3	(<u>2,000</u>)	Liability
	<u>(\$ 1,500)</u>	Net liability

The companies have a master netting arrangement which applies to all three positions. For purposes of this example, assume all contracts are due within one year. Based on available CDS information, the risk of default associated

with Company E is 10% and Counterparty Q's risk of default is 5%. As the derivatives are in a net liability position, Company E calculates the credit risk adjustment using its own default risk and determines that a portfolio level credit risk adjustment of \$150 is required on the net liability position.

Company E must allocate this adjustment for financial reporting purposes. Therefore, it considers the impact of using each of the four acceptable methods as follows:

- Relative fair value – Method 1: Company E allocates the total credit adjustment of \$150 to each of the derivatives in its portfolio, based on the relative value of each derivative to the net position with the counterparty. For example, the allocation to Derivative 1 is calculated as follows:

Derivative 1	(\$ 1,000)
Divided by net position	(<u>1,500</u>)
Allocation percentage	66.66%
Multiplied by total credit adjustment	<u>150</u>
Allocated credit adjustment	<u><u>\$ 100</u></u>

- Relative fair value – Method 2: Company E allocates the total credit adjustment to only those derivatives in the same position as the net position based on their relative fair values (in this case, only to the liabilities). For example, the allocation to Derivative 1 is calculated as follows:

Derivative 1	(\$ 1,000)
Divided by total liability position	(<u>3,000</u>)
Allocation percentage	33.33%
Multiplied by total credit adjustment	<u>150</u>
Allocated credit adjustment	<u><u>\$ 50</u></u>

- Relative credit adjustment: Company E calculates the total credit risk adjustment for each derivative on a stand-alone basis (using the in-exchange approach described below). For example, the standalone credit risk adjustment for Derivative 1 is calculated as (\$1,000) multiplied by 10% (the risk of default for a liability position), which results in a standalone credit risk adjustment of \$100. However, note that the standalone adjustment for Derivative 2 would be calculated by applying the risk of default for Counterparty Q, resulting in a standalone credit risk adjustment of (\$75).

Company E then allocates the net credit risk adjustment of \$150 to each derivative based on its relative standalone credit adjustment. The allocation to Derivative 1 is calculated as follows:

Derivative 1 – standalone credit risk	\$ 100
Divided by Total credit risk adjustment, in-exchange basis	<u>225</u>
Allocation percentage	44.44%
Multiplied by total credit adjustment	<u>150</u>
Allocated credit adjustment	<u><u>\$ 67</u></u>

- In-exchange or full-credit: In the in-exchange method, netting arrangements are ignored and credit risk adjustments are calculated for each derivative on a standalone basis, as discussed in the first step in the relative credit adjustment approach above. Application of the in-exchange method results in a higher overall credit risk adjustment than would be recorded if the netting arrangements are applied.

The overall results for each of the methods are depicted below:

	Relative fair value - Method 1	Relative fair value - Method 2	Relative credit adjustment	In-exchange or full-credit
Derivative 1	\$ 100	\$ 50	\$ 67	\$ 100
Derivative 2	(150)	-	(50)	(75)
Derivative 3	<u>200</u>	<u>100</u>	<u>133</u>	<u>200</u>
Total adjustment	<u>\$ 150</u>	<u>\$ 150</u>	<u>\$ 150</u>	<u>\$ 225</u>
Net asset adjustment	\$ (150)	\$ -	\$ (50)	\$ (75)
Net liability adjustment	\$ 300	\$ 150	\$ 200	\$ 300

To the extent Company E elects gross presentation under FSP FIN 39-1, it will allocate the credit risk adjustment to assets and liabilities based on the allocation methodology selected. The allocations should also be used for purposes of evaluating effectiveness of hedge accounting, in FAS 161 disclosures, and in determining how the valuation is classified in the fair value hierarchy (see discussion in Question 2-4).

3.2.2 Balance Sheet Classification

A reporting entity may apply one of the allocation methods above for purposes of the overall allocation to individual derivative instruments. However, the allocation may also need to reflect the fact that the derivative instruments may have short- and long-term components. The presence of collateral will also need to be considered as part of the allocation.

Consider the following example:

Example 3-6

Application of Credit Allocation Methods

Assume the same fact pattern as Example 3.25 above; however, Company E's derivative positions extend over multiple years. The fair values of these positions prior to any credit risk adjustment are as follows:

	Current	Long-term	Total
Derivative 1	\$ 500	\$ (1,500)	\$ (1,000)
Derivative 2	1,500	-	1,500
Derivative 3	<u>(1,000)</u>	<u>(1,000)</u>	<u>(2,000)</u>
Net position	<u>\$ 1,000</u>	<u>\$ (2,500)</u>	<u>\$ (1,500)</u>

Note that the time value of money in the calculation of the credit risk adjustment has been ignored for purposes of this example to simplify the presentation.

Consistent with Example 3-5 above, Company E determines that a net \$150 credit risk adjustment is required. However, in this example, Company E must allocate the adjustment among the current and long-term assets and liabilities. To the extent that Company E has elected gross presentation of derivative assets and liabilities under FSP FIN 39, it will be required to allocate the adjustment to the individual current and long-term positions following a rational and consistent allocation methodology. For example, if Company E selects the relative fair value approach - method 1, the allocations to the current- and long-term portions of Derivative 1 would be calculated as follows:

Derivative 1 – current portion	\$ 500
Divided by net position	(<u>1,500</u>)
Allocation percentage	(33.33%)
Multiplied by total credit adjustment	<u>150</u>
Allocated credit adjustment	<u>(\$ 50)</u>
Derivative 1 – long-term	(\$ 1,500)
Divided by net position	(<u>1,500</u>)
Allocation percentage	100%
Multiplied by total credit adjustment	<u>150</u>
Allocated credit adjustment	<u>\$ 150</u>

Application of this approach results in the same total allocation to Derivative 1 as illustrated in the application of the relative fair value approach – method 1 in Example 3-5 above.

The overall result for each of the positions applying this methodology is as follows:

	Current	Long-term	Total
Derivative 1	\$ (50)	\$ 150	\$ 100
Derivative 2	(150)	-	(150)
Derivative 3	<u>100</u>	<u>100</u>	<u>200</u>
Total adjustment	<u>\$ (100)</u>	<u>\$ 250</u>	<u>\$ 150</u>
Net asset adjustment	\$ (200)	\$ -	\$ (200)
Net liability adjustment	\$ 100	\$ 250	\$ 350

Note that these calculations may become very complicated in the case of a large portfolio with multiple agreements. As a result, a question has arisen as to whether it is appropriate to allocate the adjustment based on a simplified methodology; for example, to allocate the entire adjustment to the current asset position or long-term liability position. We believe that allocation to the individual derivatives (or a methodology that materially approximates such allocation) is necessary to comply with the reporting requirements of FAS 157 and FAS 161.

3.2.3 Allocation Between the Income Statement and Other Comprehensive Income

In some cases a reporting entity will have derivatives designated in hedging relationships and derivatives reported at fair value through the income statement with the same counterparty. The methodologies outlined above should also be applied in determining the appropriate allocation of the adjustment between net income and other comprehensive income. However, this calculation would need to consider collateral or other credit support, which reduces the overall exposure. We believe a reporting entity should develop a systematic and rational approach to the allocation of collateral among its positions. This allocation may also follow the approaches described above.

**Appendix A:
Impact of Nonperformance Risk on the
Measurement of Liabilities at Fair Value**

Appendix A: Impact of Nonperformance Risk on the Measurement of Liabilities at Fair Value

The incorporation of nonperformance risk is a key component of a fair value measurement. The Board's conclusions with respect to this issue are discussed in FAS 157, Appendix C. Paragraph C42 states:

Nonperformance risk includes (but may not be limited to) the reporting entity's own credit risk. In the Exposure Draft, the Board concluded, as it did in Concepts Statement 7, that a fair value measurement for a liability always considers the credit risk of the entity obligated to perform. Those who might hold the reporting entity's obligations as assets would consider the effect of the entity's credit risk in determining the prices they would be willing to pay. Therefore, this Statement clarifies that a fair value measurement for a liability should consider the effect of the reporting entity's own credit risk (credit standing) on the fair value of the liability in all periods in which the liability is measured at fair value. (emphasis added)

However, many reporting entities have struggled to understand the concept of nonperformance risk in the calculation of liabilities reported at fair value. Specifically, a reporting entity may argue that it intends to perform on the obligation or may conceptually disagree with the "transfer" concept adopted by the FASB. FAS 157, paragraph 15 states, in part:

A fair value measurement assumes that the liability is transferred to a market participant at the measurement date (the liability to the counterparty continues; it is not settled) and that the nonperformance risk relating to that liability is the same before and after its transfer. Nonperformance risk refers to the risk that the obligation will not be fulfilled and affects the value at which the liability is transferred. Therefore, the fair value of the liability shall reflect the nonperformance risk relating to that liability. Nonperformance risk includes but may not be limited to the reporting entity's own credit risk. 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.

This guidance results in a significant change. Under FAS 157, the fair value of a liability is calculated based on the cost of transferring the liability to a third party market participant, assuming that the liability will live on in its current form. In addition, the nonperformance risk relating to that liability is the same before and after its transfer. This concept assumes that the liability would transfer to a credit-equivalent entity. However, transfers of liabilities are rare. In practice, most liabilities are settled with the holder or may be extinguished through execution of an offsetting contract. Therefore, measuring the "transfer" value of a liability may be a challenge when settlement has historically been the primary means for exit.

As a result, many reporting entities have objected to the transfer concept and have supported continued measurement based on settlement value (or the amount the reporting entity would be required to pay to extinguish the liability). In FAS 157, paragraph C40, the FASB recognized and acknowledged that in some cases, a reporting entity does not have the intent to transfer a liability and would benefit more from settling it. However, the FASB concluded that settlement is an entity-specific decision and the difference between the

settlement value and fair value should be an element of performance that is measured over the settlement period.

In application, there may be significant differences between settlement value and transfer value. Among the differences is the impact of credit risk, which is often not considered in the settlement of a liability, as demonstrated in the following example:

Example A-1: Transfer value versus settlement value

Consider a debt obligation held by a bank with a face value of \$100,000 and a market value of \$95,000. For purposes of this example, assume market interest rates are consistent with the amount in the note; however, there is a \$5,000 discount due to market concerns about the risk of nonperformance.

Settlement value

Absent exceptional circumstances, we would expect that the counterparty (Counterparty A) would be required to pay the full face value of the note to settle the obligation, as the bank may not be willing to discount the note by the market discount or the credit risk adjustment. Therefore, the settlement value would be equal to the face amount of the note.

Transfer value

In order to calculate the transfer value, Counterparty A must construct a hypothetical transaction in which another party (Counterparty B), with a similar credit profile, is seeking financing on terms that are substantially the same as the note. Counterparty B could choose to enter into a new note agreement with the bank or receive the existing note from Counterparty A in a transfer transaction. In this hypothetical transaction, Counterparty B should be indifferent to obtaining financing through a new bank note or assumption of the existing note in transfer for a payment of \$95,000. Therefore, the transfer value would be \$95,000, \$5,000 less than the settlement amount.

In order to ensure compliance with FAS 157, reporting entities must adopt an approach to valuing liabilities that incorporates the transfer concept. While some reporting entities may be experiencing difficulty applying these new concepts, there is no exemption from, or “practical expedient” to, these requirements.

Question 3-1: If a reporting entity intends to settle a liability shortly after the end of the reporting period, can settlement value be used as a proxy for fair value?

PwC Interpretive Response

No. The basic premise in the calculation of the fair value of a liability pursuant to FAS 157 is that the liability lives on until its maturity. Therefore, fair value should be determined based on the transfer value of the liability, inclusive of nonperformance risk. Any difference between the settlement amount and fair value measurement of the liability should be recognized in the period of settlement.

Impact of Credit Deterioration

One objection that has been raised by some reporting entities in considering the requirement to incorporate nonperformance risk in the fair value measurement of liabilities is that the impact will not be consistent with the reporting entity's financial performance. A deterioration of one's own credit standing results in a higher discount rate to apply to the future cash flows associated with a liability. Application of a higher discount rate will result in a reduction of a liability, creating a gain that is reported in the income statement.

Conversely, a credit improvement can result in a loss that is reported in the income statement when factored into a fair value measurement of a liability (as the liability would be expected to increase). The overall result is recognition of gains when a reporting entity's financial condition deteriorates and losses when its financial condition strengthens.

Some reporting entities have continued to question this concept, in particular when the entity is having financial difficulty or there is doubt about the ability of the entity to realize those gains. However, while the FASB acknowledged these practical concerns, in paragraph C47 of FAS 157 it concluded that conceptually credit risk is an essential component of a fair value measurement and should be included to appropriately reflect fair value. If fair value is considered from the perspective of the creditor, it is reasonable that the fair value of the liability decreases for credit deteriorations because it is no longer worth as much to the market participant and increases for credit improvements because it is now worth more to a market participant.

Appendix B: Definition of Key Terms

Appendix B: Definition of Key Terms

Credit default swap rate

A credit default swap rate is the current market rate for the transfer of a company's credit exposure to a counterparty. An example of a credit default swap is a bilateral financial contract in which a counterparty accepts the credit default risk of an issuer for a certain issuance or event. A CDS can be cash-settled or physically-settled by delivery of the underlying instrument in exchange for payment of the contractual amount (e.g., a fixed one-time payment or annual payments that mirror the obligation). CDS rates can also be obtained from pricing services and for specified obligations for which these swaps are available, or for general categories or issues. For example, an issue that is estimated to have characteristics of a general obligation with a Single "A" rating may be able to obtain an average CDS rate for the obligation for a specified maturity.

Credit rating

Credit ratings are financial indicators (e.g., ratings for an entity's debt or bonds) and represent external indicators of an entity's credit worthiness. Credit ratings are assigned to corporations by credit ratings agencies, such as Standard & Poor's, Moody's or Fitch Ratings.

Credit spread

Credit spreads represent the difference in the yield among securities due to differences in credit quality. A higher credit spread is an indication of higher credit risk and vice-versa. Credit spreads are generally provided in comparison to the yield on a risk free (Treasury) or benchmark security (e.g., LIBOR).

Historical default rate

Tables of historical default rates are routinely published by a variety of sources such as Standard & Poor's. Published default information is provided by credit category (e.g., AAA, AA, A, etc.) and tenor (e.g., one year, five years, ten years). Cumulative historical default rate tables can be useful information to understand the cash flows associated with expected defaults of a security or a portfolio of securities.

Margin agreement

A **margin agreement** is a legally binding contract that requires one or both parties to the agreement to post collateral when the uncollateralized exposure is greater than a pre-established threshold. Additional collateral may be required to be posted if this uncollateralized exposure increases.

Master netting arrangement

A master netting arrangement generally provides that multiple derivative contracts with the same counterparty will be offset in the event of a default on or termination of any one of the contracts. The netting provisions result in a credit risk exposure based on the "net" position rather than at the individual derivative level. Master netting arrangements may also incorporate other positions with the counterparty (e.g., other non-derivative obligations and other forms of collateral).

Appendix C: Technical References and Abbreviations

Appendix C: Technical References and Abbreviations

The following tables should be used as a reference for technical references and abbreviations used throughout this publication:

Technical References

FAS 107	Statement of Financial Accounting Standards No. 107, <i>Disclosures of Fair Value of Financial Instruments</i> .
FAS 115	Statement of Financial Accounting Standards No. 115, <i>Accounting for Certain Investments in Debt and Equity Securities</i>
FAS 133	Statement of Financial Accounting Standards No. 133, <i>Accounting for Derivative Instruments and Hedging Activities</i>
FAS 157	Statement of Financial Accounting Standards No. 157, <i>Fair Value Measurements</i>
FAS 161	Statement of Financial Accounting Standards No. 161, <i>Disclosures about Derivative Instruments and Hedging Activities, an amendment of FASB Statement No. 133</i>
FIN 39	FASB Interpretation No. 39, <i>Offsetting of Amounts Related to Certain Contracts – an interpretation of APB Opinion No. 10 and FASB Statement No. 105</i>
FSP FAS 157-3	FASB Staff Position No. 157-3, <i>Determining the Fair Value of a Financial Asset When the Market for That Asset Is Not Active</i>
FSP FIN 39-1	FASB Staff Position FIN 39-1, <i>Amendment of FASB Interpretation No. 39</i>
EITF 08-5	EITF Issue No. 08-5, <i>Issuer's Accounting for Liabilities Measured at Fair Value with a Third-Party Credit Enhancement</i>
SAB 74	Staff Accounting Bulletin No. 74, <i>Disclosure of the Impact That Recently Issued Accounting Standards Will Have on the Financial Statements of the Registrant When Adopted in a Future Period</i>

Abbreviations

CDS	Credit default swap
EITF	Emerging Issues Task Force
FASB	Financial Accounting Standards Board
FSP	FASB Staff Position
NYMEX	New York Mercantile Exchange
SAB	Staff Accounting Bulletin
SEC	Securities and Exchange Commission
U.S.	United States

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How PwC Can Help

Application of the principles of FAS 157 in the measurement of fair value has been a challenge for many reporting entities. Determination of the appropriate credit risk adjustment in a fair value measurement may involve a complex process that requires significant judgment. Our fair value consultants and Assurance professionals frequently advise companies regarding credit risk adjustments and fair value measurements, including:

- Sources of credit risk information;
- Impact of collateral and other credit enhancements on the measurement of fair value;
- Application of different methodologies in measuring the credit risk adjustment; and,
- Allocation of the credit risk adjustment to individual instruments.

Our professionals bring experience in applying the credit risk adjustment framework and assist reporting entities in understanding and applying the various measurement methodologies.

If you have any questions or comments, please contact your PricewaterhouseCoopers partner.

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