

STANDARD  
& POOR'S

# S&P CREDIT DEFAULT SWAP (CDS) U.S. INDICES

INDEX METHODOLOGY

January 2009

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# Introduction

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Standard & Poor's Credit Default Swap (CDS) U.S. Indices are designed to track the credit default swap market for U.S. corporate credits.

Credit Default Swaps are over-the-counter, tradable, credit derivative contracts that are similar to insurance policies. A CDS is a bilateral contract in which one party (usually known as the protection buyer) pays a fee or premium to another (generally referred to as the protection seller) to protect itself against a loss that may be incurred from its exposure to a reference entity (bond issuer) which experiences a credit event. This occurs when the reference entity on which the CDS has been written is unable to service and pay its debt. If a credit event occurs, the seller of the protection will make a payment to the buyer of the protection in exchange for an obligation (i.e. a bond) of the reference entity.

Each reference entity in a given index is associated with, most often, a specific senior, unsecured bond issue known as a reference obligation. Each reference obligation is representative of the type of bond obligation within the reference entity's corporate debt structure that must be affected for a credit event to be triggered. Reference obligations for the S&P CDS U.S. Indices are researched using the S&P Ratings Direct<sup>®</sup> database.

## Index Family

The S&P CDS U.S. Index family includes the following:

**S&P CDS U.S. Investment Grade Index.** Each series of the S&P CDS U.S. Investment Grade Index has a 5¼ year maturity at inception and is comprised of 100 equally weighted (1%) reference entities. These reference entities include corporate names with public debt or issuer ratings assigned by two of Standard & Poor's, Fitch, and Moody's of at least BBB-, BBB-, and Baa3, respectively.

**S&P CDS U.S. High-Yield Index.** Each series of the S&P CDS U.S. High-Yield Index has a 5¼ year maturity at inception and is comprised of 80 equally weighted (1.25%) reference entities. These reference entities include corporate names with public debt or issuer ratings assigned by two of Standard & Poor's, Fitch, and Moody's below BBB-, BBB-, and Baa3, respectively.

**S&P 100 CDS Index.** Each series of the S&P 100 CDS Index has a 5¼ year maturity at inception and will look to include the constituents in the S&P 100 equity index (on average, about 80-90 of the index constituents), that have sufficient liquidity in the five-year CDS market. Reference entities are weighted in accordance with their market capitalization weighting in the S&P 100 equity index, with periodic adjustment. Some constituents in the S&P 100 do not have an active, liquid CDS market. As such, these companies are not included in the S&P 100 CDS Index. The weights of these excluded companies are redistributed evenly among the other reference entities in the index.

# Eligibility Criteria

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## Eligibility Factors

### Additions to the S&P CDS U.S. Indices

**Ratings.** All reference entities added to the Investment Grade index must have public debt or issuer ratings assigned by two of Standard & Poor's, Fitch, and Moody's of at least BBB-, BBB-, and Baa3, respectively, at the time they are added to the index. All reference entities added to the High-Yield index must have public debt or issuer ratings assigned by two of Standard & Poor's, Fitch, and Moody's below BBB-, BBB-, and Baa3, respectively, at the time they are added to the index. Although most reference entities added to the S&P 100 CDS index will be investment grade, there is no minimum ratings criterion for inclusion in this index.

**Liquidity.** Adequate liquidity for all reference entities in the five-year CDS market is assessed by looking at various measures of current and historical secondary market activity including (but not limited to) the depth of market on a given name, the bid/offer spread width, and the continuity of quotes over a selected time period.

**Domicile.** All reference entities are U.S. companies.

**Sector Classification.** Reference entities, for the Investment Grade and High-Yield indices, are chosen with the intent of contributing to a sector balance representative of the broader CDS market.

### Deletions from the S&P CDS U.S. Indices

- A specific reference entity in the index may experience what is defined by the International Swaps and Derivatives Association ("ISDA") as a "Succession Event."<sup>1</sup> A Succession Event means "an event such as a merger, consolidation, amalgamation, transfer of assets or liabilities, demerger, spin-off or other similar event in which one entity succeeds to the obligations of another entity, whether by operation of law or pursuant to any agreement. ..." *2003 ISDA Credit Derivatives Definitions*, Article II, at Section 2.2(b). For purposes of S&P CDS U.S. Indices, the S&P CDS Index Committee (see "Index Governance"), in order to determine a successor in the case

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<sup>1</sup> The definitions of "Succession Event" and "Credit Event" excerpted in this section appear in the *2003 ISDA Credit Derivatives Definitions* (©2003 International Swaps and Derivatives Association, Inc. "ISDA®") and the excerpts are reproduced with ISDA's permission. These definitions may not be reproduced without the express written permission of ISDA. The 2003 ISDA Credit Derivatives Definitions are available from ISDA through their web site, at [www.isda.org](http://www.isda.org).

of a Succession Event, will apply the provisions for determining a successor set forth in Section 2.2 of Article II of the 2003 ISDA Credit Derivatives Definitions. The occurrence of a Succession Event will result in (1) the replacement of a reference entity in the affected S&P CDS U.S. Index with a new successor entity(s) or (2) a split in the index weighting between a new successor entity(s) and the original reference entity. The S&P CDS Index Committee is solely responsible for determining whether and when a Succession Event affects an S&P CDS Index and how the event will be treated.

- A specific reference entity in the index may experience what is defined by ISDA as a “Credit Event.” With respect to a credit derivative transaction, ISDA has defined “Credit Event” to mean “one or more of Bankruptcy, Failure to Pay, Obligation Acceleration, Obligation Default, Repudiation/Moratorium, or Restructuring, as specified in the relation Confirmation. ...” *2003 ISDA Credit Derivatives Definitions*, Article IV, at Section 4.1. (The 2003 ISDA Credit Derivatives Definitions further define the capitalized terms used in the definition of Credit Event.) For purposes of the S&P CDS U.S. Indices, S&P shall treat the following as Credit Events that may result in the removal of a reference entity from the index: (1) Bankruptcy, as defined by ISDA in Section 4.2 of Article IV and (2) Failure to Pay, as defined by ISDA in Section 4.5 of Article IV. The S&P CDS Index Committee may decide to include, in its sole discretion, other ISDA definitions that will be treated as a Credit Events for the purposes of the S&P CDS U.S. indices. The S&P CDS Index Committee is solely responsible for determining whether and when a Credit Event affects an S&P CDS U.S. Index and how the event will be treated
  - Public sources of information including, at a minimum, Bloomberg and Yahoo!Finance are monitored on a daily basis for potential Succession and Credit Events by the S&P Index Services group.
- Deletions from the S&P 100 CDS index will also occur when a reference entity is removed from the S&P 100 equity index. If the replacement company added to the S&P 100 equity index is deemed to have sufficient CDS liquidity, the new company will be added to the S&P 100 CDS index. (See further under “Index Maintenance”).
- If a reference entity has a ratings change subsequent to inclusion in a specific series of an index, the entity will not be deleted from that specific series, but may not appear in the next series of the index.
- The S&P CDS Index Committee, in its sole discretion, may replace a reference obligation or reference entity, at any time, if it believes it is necessary for the proper maintenance of the index.

### **Timing of Changes**

Changes to the S&P CDS U.S. Indices are made at Standard & Poor's sole discretion, when deemed appropriate by the S&P CDS Index Committee. In the case of a Succession Event, a change would be made upon the confirmed completion of the relevant corporate action, as defined above. In the case of a Credit Event, a change

would be made at the end of the Business Day upon which the event has been declared by the S&P CDS Index Committee.

A “Business Day(s)” is defined as days on which the Securities Industry and Financial Markets Association (SIFMA<sup>®</sup>) declares the U.S. fixed income markets open.

Changes to S&P CDS U.S. Indices, which are implemented as a result of the occurrence of any of the events listed above, will result in the publication of a new index *version*. S&P will release information concerning any new index versions via its Web site at [www.indices.standardandpoors.com](http://www.indices.standardandpoors.com).

# Index Construction

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## **Approaches**

The constituents of Standard & Poor's CDS U.S. Indices are selected with a focus on liquidity and with the goal of supporting the investment community's needs.

### **Index Calculations**

Each S&P U.S. CDS Index series has a given number of reference entities and a fixed coupon. This coupon is determined prior to the onset of each index series, and is the weighted spread of the underlying reference entities that equates the value of the index to par value (100%) at the time of calculation. The fixed index coupon will be rounded to the nearest multiple of five basis points. Quarterly coupon payment dates on CDS contracts are the 20<sup>th</sup> (or the next Business Day) of March, June, September, and December of each year.

Each new index series of a given index has a starting price value of 100% and will commence on a Rollover Date (as described below in "Index Maintenance"). S&P publishes an index level and spread for different *types* of each index, which vary with respect to how they handle the occurrence of certain events (as described below under "Credit Events" and "Succession Events").

Although the individual U.S. reference entities that determine the index level, especially in the investment grade arena, may have CDS spreads priced with restructuring (MR) as a Credit Event, all S&P CDS U.S. indices follow a no-restructuring (XR) convention.

A recovery rate of 40% on all reference obligations is initially assumed for all index calculations, however, initial recovery rates used in index calculations may be altered due to changing market assumptions in pricing. The S&P CDS Index Committee, in its sole discretion, may change recovery rate assumptions for the calculation of the indices.

## Index Pricing

Index calculations are based on a starting price to par value of 100%.

The daily spreads on each single-name CDS, interpolated when the maturity of the single name CDS differs from the maturity of the index, are converted into prices by marking to market each single name CDS. This is done by valuing each single name CDS spread relative to the fixed coupon of the index.

The Marked-to-Market (MTM) price of a constituent is:

$$p_c = 100\% + (C - S) * Risky Annuity$$

where,

$C$  = Coupon on the Index

$S$  = Current CDS spread on the constituent

$$Risky Annuity \approx \sum_{i=1}^n (DF_i * SP_i * d_i) + \sum_{i=1}^n (DF_i * (SP_{i-1} - SP_i) * d_i / 2)$$

where,

$DF_i$  = Risk-free discount factor from the USD swap curve for time  $T_0$  to  $T_i$

$SP_i$  = Survival probability from  $T_0$  to  $T_i$

$d_i$  = Accrual period from  $T_{i-1}$  to  $T_i$  (in years) calculated on an Actual/360 basis

$n$  = Number of time periods

If the current CDS spread on the constituent widens, then the perception of credit conditions for that entity in the marketplace has worsened, the price change is negative, and the price value of the constituent CDS will be less than 100% (and vice-versa). (See Appendix for single name CDS pricing overview)

Each day, the index level is the weighted average of the price values for each single-name CDS within the index:

$$Index_{level} = \sum w_c p_c$$

where,

$w_c$  = individual weight of constituent  $c$  in the index

$p_c$  = CDS price value of constituent  $c$

The spread of the index can be derived by solving for the following equation:

*Index<sub>spread</sub>*:

$$\sum(C-S)*Constituent Risky Annuity=(C- Index_{spread})* Index Risky Annuity$$

where,

*C* = Coupon on the Index

*S* = Current CDS spread on the constituent

$$Risky Annuity \approx \sum_{i=1}^n (DF_i * SP_i * d_i) + \sum_{i=1}^n (DF_i * (SP_{i-1} - SP_i) * d_i / 2)$$

where,

*DF<sub>i</sub>* = Risk-free discount factor from the USD swap curve for time *T<sub>0</sub>* to *T<sub>i</sub>*

*SP<sub>i</sub>* = Survival probability from *T<sub>0</sub>* to *T<sub>i</sub>*

*d<sub>i</sub>* = Accrual period from *T<sub>i-1</sub>* to *T<sub>i</sub>* (in years) calculated on an Actual/360 basis

*n* = Number of time periods

S&P publishes daily index levels for each type of a CDS U.S. index series. These levels may incorporate certain adjustments, as noted below, to the calculations previously mentioned.

Index levels are calculated out to three decimal points. Index spreads are not quoted with decimals.

### Index Types

Index levels are published daily for three types of each of the S&P CDS U.S. Index Family. The three types of each index are as follows:

<i>Investment Grade</i>	<i>High Yield</i>	<i>100</i>
S&P CDS US Investment Grade (Base)	S&P CDS US High-Yield (Base)	S&P 100 CDS (Base)
S&P CDS US Investment Grade Event Inclusive	S&P CDS US High-Yield Event Inclusive	S&P 100 CDS Event Inclusive
S&P CDS US Investment Grade Rolling	S&P CDS US High-Yield Rolling	S&P 100 CDS Rolling

All types of a given index have the same constituents at the onset of an index series, but differ with respect to the treatment of 1) Credit Events, 2) Succession Events, and 3) Index Coupon Accruals. Therefore, the index level of one type may differ from the index level of another.

## **1) CREDIT EVENTS**

### **A) Base**

In the Base index, after a Credit Event occurs in an underlying reference entity, the entity will drop out of the index and the index level will be derived from the remaining names left in the index. Post an initial Credit Event, equally weighted CDS indices, such as the Investment Grade (100 constituents) and High-Yield (80 constituents) indices, will be comprised of 99 and 79 credits, respectively. Index calculations will then be done by averaging the remaining names. As such, the level of the index, that presumably had fallen (i.e., spread had widened) based on the impending default of the credit, should instead go up.

If there is an occurrence of a Credit Event on a reference entity in the S&P 100 CDS index, that entity will likely be removed from the S&P 100 equity index and the index will be reweighted. (See “Index Maintenance”). If it is not removed, it will follow the above procedure.

### **Example using the Investment Grade Index**

<b>Reference Entities</b>	<b>Weight (%)</b>	<b>Constituent Price (s)</b>	<b>Index Level</b>
Entity 1-99	1	99.000	
Entity 100	1	60.000	98.610 (Pre Credit Event)
Entity 1-99	1	99.000	99.000 (Post Credit Event)

Each day, the index level for the base index, will still be the weighted average of the price values for each single-name CDS within the index:

$$Index_{level} = \sum w_c p_c$$

where,

$w_c$  = individual weight of constituent  $c$  in the index

$p_c$  = CDS price value of constituent  $c$

### **B) Event Inclusive (patent pending)**

In the Event Inclusive indices, after a Credit Event occurs in an underlying reference entity, the post Credit Event price for that entity will initially be the specific recovery assumption that was used prior to the occurrence of the Credit Event (most often 40%) or, in certain circumstances, an announced market recovery assumption. When a final settlement price has been determined by an ISDA Credit Event Auction (“Final Settlement Price”) and made available to S&P by ISDA, the price for that specific entity will be adjusted to the Final Settlement Price, which will be used in all subsequent index calculations.

If there is an occurrence of a Credit Event on a reference entity in the S&P 100 CDS index, that entity will likely be removed from the S&P 100 equity index. If the entity is removed from the S&P 100 equity index within two Business Days after the occurrence of a Credit Event, the entity will be removed from the S&P 100 CDS index and there will be no Final Settlement Price used for that entity in the index calculations. If there is an interim period before removal, the price for the affected reference entity will be the recovery rate assumption (i.e. 40% or what the recovery rate assumption was changed to) used in index calculation immediately prior to the Credit Event.

The index level for the Event Inclusive index will be:

$$Index_{level} = \sum w_c * p_{uc} + \sum w_c * R_{ac}$$

where,

$w_c$  = individual weight of constituent  $c$  in the index

$p_{uc}$  = CDS price value of unaffected constituent  $uc$

$R_{ac}$  = Recovery price of affected constituent  $ac$

#### Example using the Investment Grade Index

Reference Entities	Weight (%)	Constituent Price(s)	Index Level
Entity 1-99	1	100.000	
Entity 100	1	50.000	99.500 (Pre Credit Event)
Entity 1-99	1	100.000	
Entity 100	1	40.000 (initial recovery assumption)	99.400 (At Credit Event)
Entity 1-99	1	100.000	
Entity 100	1	47.000 (final recovery price set in auction protocol)	99.470 (After Credit Event)

## 2) SUCCESSION EVENTS

### A) Base

In the Base type of the Investment Grade and High-Yield indices, once the S&P CDS Index Committee has determined, using the relevant criteria set forth in the *2003 ISDA Credit Derivatives Definitions* (noted above), that a Succession Event has occurred, the index will adjust constituency and weightings according to the guidelines set forth in the criteria. The formula for index calculation will not change, and any change in spread due to the addition of a successor(s) will be shown in the index level accordingly.

If there is a Succession Event in the S&P 100 CDS Index and the new successor(s) are members of the S&P 100 Index, the constituency of the index may adjust and the index will be reweighted. (See “Index Maintenance”).

Each day, the index level for the base index, will still be the weighted average of the prices of each single-name CDS within the index.

$$Index_{level} = \sum w_c p_c$$

where,

$w_c$  = individual weight of constituent  $c$  in the index

$p_c$  = CDS price value of constituent  $c$

### **Example using the Investment Grade Index**

<b>Reference Entities</b>	<b>Weight (%)</b>	<b>Constituent Price(s)</b>	<b>Index Level</b>
Entity 1-99	1	100.000	
Entity 100	1	99.400	99.994 Pre-Succession
Entity 1-99	1	100.000	
Entity 100 (weight adjusted as per Succession Event)	0.5	99.000	
Entity 101(new entity added as per Succession Event)	0.5	98.750	99.989 Post-Succession

### **B) Event Inclusive (patent pending)**

In the Event Inclusive indices, once the S&P CDS Index Committee has determined, using the relevant criteria set forth in the *2003 ISDA Credit Derivatives Definitions* (noted above), that a Succession Event has occurred, the index will adjust constituency and weightings according to the guidelines set forth in the criteria. However, there will be a further adjustment made so that no change is reflected in the index level solely due to the addition of a successor(s).

The index level for the Event Inclusive index will be:

$$Index_{level} = \sum w_c p_c + \sum SE_{adj}$$

where,

$w_c$  = individual weight of constituent  $c$  in the index

$p_c$  = CDS price value of constituent  $c$

$SE_{adj}$  = index level changes due solely to the replacement of the constituents (see below)

**Example using the Investment Grade Index**

Reference Entities	Weight (%)	Constituent Price(s)	Index Level
Entity 1-99	1	100.000	
Entity 100	1	99.400	99.994 (Pre-Succession)
Entity 1-99	1	100.000	
Entity 100 (fully replaced by new entity)	1	98.750, new entity price	99.988 (Level Prior To Adjustment)
Difference attributable to Succession Event			99.994 - 99.988 = 0.006
			99.988 + 0.006 = 99.994 (Level Inclusive Of Succession Event Adjustment)
Entity 1-99	1	99.000	
Entity 100	1	98.000	98.990 + 0.006 (index adjustment) = 98.996 (Post Succession Event Level)

### **3) INDEX COUPONS**

All Event Inclusive indices also have adjustments made to their index level on each quarterly payment date to reflect the fixed coupon paid (by the buyer of protection) on a CDS index contract. The coupon amounts bear interest at the relevant 13-week T-Bill discount rate posted on TreasuryDirect®, in accordance with the appropriate day count convention. Accruals are reflected in index levels on the quarterly coupon payment dates of CDS contracts which are the 20<sup>th</sup> (or next Business Day) of March, June, September, and December of each year.

The table below is a summary of the treatment of events in the Base and Event Inclusive indices:

<b>Event</b>	<b>S&amp;P 100 CDS</b>	<b>Investment Grade/High-Yield</b>	<b>S&amp;P 100 CDS – Event Inclusive</b>	<b>Investment Grade/High-Yield – Event Inclusive</b>
Succession Events	Membership change assuming new constituent is in the S&P 100 or deletion of constituent and reweighting	Membership change	Membership change assuming new constituent is in the S&P 100 and “index level adjustment,” or deletion of constituent and reweighting	Membership change and subsequent “index level adjustment”
Credit Events	Credit Removal	Credit Removal	Credit Removal as entity will likely be removed from S&P 100	Credit adjustment to reflect recovery price
S&P 100 Equity Index Constituent Change	Membership change, assuming adequate CDS liquidity, and reweighting	N/A	Membership change, assuming adequate CDS liquidity, with reweighting and “index level adjustment”	N/A
Quarterly Index Coupon Payment	N/A	N/A	Accrue each payment at relevant rate/adjust index level	Accrue each payment at relevant rate/adjust index level
Liquidity, rating or other inclusion criteria change	Change at next new series	Change at next new series	Change at next new series	Change at next new series

#### **Rolling Index**

The Rolling indices are perpetual (no maturity) and incorporate all adjustments made in the Event Inclusive indices.

The reference entities of the Rolling indices will be adjusted in accordance with each new series of a CDS Index. However, whereas the other indices have a maturity of approximately five years, the Rolling type does not have a maturity as it continually reflects the CDS spread in line with each respective new series issued for the other types of the index. In addition, while the other indices reset their respective coupon with each new series, the Rolling indices have only one initial coupon set at inception. Daily changes in the CDS spreads of constituents in the Rolling indices are accounted for each day, through the end of day MTM process described above.

As stated above, the Rolling type incorporates all adjustments made in the Event Inclusive indices for Credit Events, Succession Events, and index coupon payments/accruals.

### Example using the Investment Grade Index

Index type	Coupon	Adjustments	Index level	Rollover Date	Coupon	Index Level
Event Inclusive	Set at onset of first series	Succession,Credit Events,Coupon Accruals		New Constituent, new series with reset coupon and level		
Example	100 bps	.025	99.50		135 bps	100.000
Rolling	Set at onset of first series	Succession,Credit Events,Coupon Accruals		New Constituents, same series with initial coupon and no reset of level		
Example	100 bps	.025	99.50		100 bps	99.400

### Data Sources

Mid spread CDS pricing on all reference entities are received at 05:00 PM ET each Business Day from Credit Market Analysis<sup>®</sup> (CMA). Other data sources, in addition to CMA, may be added at the discretion of the S&P CDS Index Committee. If a spread for a reference entity(s) is not received on a given day, S&P will attempt to obtain an alternate source of pricing. If a spread for a reference entity is not received by CMA or an alternate source on a given Business Day, then the prior day's spread for that reference entity will be used in daily index calculation.

If no spread is received on a reference entity for five consecutive Business Days, the S&P CDS Index Committee, in its sole discretion, may replace the reference entity if it believes it necessary for the proper maintenance of the index.

SuperDerivatives<sup>®</sup> is the technological platform for compiling all data sources and for the calculation of all S&P CDS U.S. Indices.

# Index Maintenance

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The S&P CDS U.S. Investment Grade and High-Yield indices (base and Event Inclusive) are maintained in accordance with the following rules:

- A new series of a given index will begin on a Rollover Date of March 20<sup>th</sup> and September 20<sup>th</sup> (or the next Business Day, if March 20<sup>th</sup> or September 20<sup>th</sup> is not a Business Day) and have maturity dates of June 20<sup>th</sup> and December 20<sup>th</sup>, respectively, in the fifth calendar year following the rollover.

Rollover Dates occur every six months to allow for the issuance of a new series that consider the current credit market, and follow and maintain all criteria, as noted, for additions.

All index constituents are, otherwise, maintained in their respective index series until the maturity of that index series, absent the occurrence of the exceptions already noted above.

Five Business Days prior to the Rollover Date, S&P will issue a release on its Web site listing the entities which will not be included in the upcoming index series as determined by the following criteria: (a) a violation of the ratings requirements previously mentioned for inclusion in the index; (b) entities that may be involved in a future Succession Event as defined above; (c) whether outstanding debt or credit default swap contracts have become illiquid as to impede the daily pricing of the index. S&P will additionally identify the new reference entities, along with their respective reference obligations, that will be included in the upcoming index series.

Two Business Days prior to the Rollover Date, S&P will issue a release on its Web site stating the new series of the index, all reference entities and applicable weights, respective reference obligations, and the fixed coupon for the upcoming index series.

The S&P 100 CDS Index is additionally maintained in accordance with the following rules:

- The weighting of the entities in the S&P 100 CDS Index is based upon their weighting in the S&P 100 equity index. However, not all members of the S&P 100 equity index have an actively traded CDS market on them. This will account for a difference in membership and weights between the two indices. The initial weights of entities in the S&P 100 CDS Index will be set and announced two Business Days prior to the Rollover Date. The weights of those constituents in

the S&P 100 that do not have a liquid CDS market will be redistributed evenly over the remaining constituents. For example:

<b>S&amp;P 100 Equity Index</b>	<b>Weight (%)</b>	<b>Liquid CDS</b>	<b>Missing Weight (%)</b>	<b>S&amp;P 100 CDS Index</b>	<b>Weight (%) 15/4 = 3.75% to each Entity</b>
Entity1	25	Yes		Entity 1	28.75
Entity2	20	Yes		Entity 2	23.75
Entity3	15	No	15		
Entity4	20	Yes		Entity 4	23.75
Entity5	20	Yes		Entity 5	23.75

The weights of each reference entity in the S&P 100 CDS index are adjusted on 1) each Rollover Date in conjunction with the issuance of a new series and 2) the Business Day after the effective date of a constituent change in the S&P 100 equity index. However, if an adjustment in weighting due to a constituent change in the S&P 100 equity index has occurred within the 30 calendar days prior to a Rollover Date, then no additional weighting change will occur on the Rollover Date, but a new series will still be issued.

- Constituents in the S&P 100 that did not have liquidity in the CDS market to justify prior inclusion in the S&P 100 CDS Index, may begin trading in the CDS market. These entities may subsequently be added to S&P 100 CDS Index at one of the adjustment times noted above.
- S&P will issue a release on its web site noting any weight or constituent change prior to the implementation of such changes.

ALL non-current series of indices (“off-the-run”) will continue to be priced and maintained and, accordingly, follow all relevant procedures and guidelines set forth above for deletions, events, and weightings.

### **Base Date**

The first series of the base and Event Inclusive types of the:  
 S&P CDS U.S. Investment Grade Index was priced on September 22, 2008.  
 S&P CDS U.S. High Yield Index was priced on September 22, 2008.  
 S&P 100 CDS Index was priced on September 22, 2008.

S&P CDS Rolling Index Calculations were priced on September 22<sup>nd</sup>, 2008.

# Index Governance

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## **Index Committee**

Standard & Poor's CDS U.S. Indices are maintained by the S&P CDS Index Committee. All members of the S&P CDS Index Committee are full-time professionals at Standard & Poor's. The Committee meets a minimum of twice per year, prior to the release of a new index series. The Committee also may meet when any issues arise that may be pertinent to the relevant indices. These include, but are not limited to, discussions involving potential replacements in the indices and Succession Event and Credit Event declarations. The Committee may revise index policy for the S&P CDS U.S. Indices at any time. All S&P CDS Index Committee discussions are confidential.

# Index Policy

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## **Announcements**

Announcements of additions, deletions, Credit Event declarations, and any other relevant information pertaining to the S&P CDS U.S. Index family are made at approximately 05:30 PM ET. Press Releases are posted on the Standard & Poor's Web site at [www.indices.standardandpoors.com](http://www.indices.standardandpoors.com).

## **Holiday Schedule**

The S&P CDS U.S. Indices are calculated when the Securities Industry and Financial Markets Association (SIFMA<sup>®</sup>) declares the U.S. fixed income markets to be open.

## **End-of-Day Calculation**

The levels of the indices are calculated at the end of each Business Day, at approximately 05:15 PM ET. The current day's index levels are published via Standard & Poor's Web site. On Business Days that SIFMA<sup>®</sup> recommends closing the U.S. fixed income markets early, index levels may be calculated at a time in accordance with the recommended early close time (usually 02:00 PM ET) set for that day. S&P CDS U.S. Index levels will also be posted on major quote vendors and other media outlets as noted below.

## **Index Releases**

Issued by S&P at the end of the Business Day. Release time is generally 05:30 P.M. ET.

# Index Dissemination

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S&P CDS U.S. Indices' levels are available through Standard & Poor's website at [www.indices.standardandpoors.com](http://www.indices.standardandpoors.com), major quote vendors (see codes below), numerous investment-oriented websites, and various print and electronic media.

## Tickers

<b>Index</b>	<b>Bloomberg</b>
S&P CDS U.S. Investment Grade	SPCDIS51
S&P CDS U.S. Investment Grade Event Inclusive	SPCDIE51
S&P CDS U.S. Investment Grade Rolling	SPCDIR50
S&P CDS U.S. High-Yield	SPCDHS51
S&P CDS U.S. High-Yield Event Inclusive	SPCDHE51
S&P CDS U.S. High-Yield Rolling	SPCDHR50
S&P 100 CDS	SPCDOS51
S&P 100 CDS Event Inclusive	SPCDOE51
S&P 100 CDS Rolling	SPCDOR50

## FTP

Additional daily index data is available via FTP by subscription.

For further information, please refer to Standard & Poor's Web site at [www.indices.standardandpoors.com](http://www.indices.standardandpoors.com).

# Appendix

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## Single Name CDS Pricing Overview

A typical CDS contract consists of two legs: one that corresponds to the fixed premium payments that are made until the maturity of the contract or until a default occurs and the other to the contingent payment that is made if a default occurs, represented by  $(1-R)$ , where  $R$  is the recovery rate expressed as a percentage. The present value ( $PV$ ) of a CDS contract can be viewed as the algebraic sum of the  $PV$ s of its two legs (fixed and contingent). For a CDS trading at par, the theoretical net present value of the two legs must equal zero.

To calculate the values necessary for pricing a CDS contract, the following is needed:

- 1) default intensities (survival probabilities) for the reference entity,
- 2) recovery rate assumptions in the case of default,
- 3) risk-free discount factors derived from standard yield curve convention using a combination of deposit rates, implied futures rates, and the relevant swap curve

The fixed premium payment in a CDS will only be paid when the reference entity has not defaulted. To account for this risk, the survival probability ( $SP$ ) that the reference entity has not defaulted by the payment date must be considered.

A default intensity ( $\lambda$ ) and, subsequently, survival probability ( $1-\lambda$ ) to any time period are implied by observable spreads on the CDS curve and can be backed out.

With a flat credit curve assumption,  $S/(1-R)$ , gives a measure of  $\lambda$  where:

$$\begin{aligned} S &= \text{CDS Current Spread} \\ R &= \text{Recovery Rate Assumption (expressed as a percentage)} \end{aligned}$$

Using continuous time to derive survival probabilities, the survival probability over time period ( $\delta t$ ) =

$$\begin{aligned} &= e^{-\lambda(t)(\delta t)} \\ &= e^{-\int_0^t \lambda(u)(du)} \end{aligned}$$

**Contingent Leg.**

If the reference entity defaults, the payment of  $(1-R)$  is made to the protection buyer. This payment is only made if there is a default and, consequently, has to be adjusted by  $SP_{i-1}-SP_i$ , the probability that default occurs in this interval. The contingent leg is valued as it is in the prior equation:

$$PV \text{ of contingent leg} = (1-R) \sum_{i=1}^n (DF_i) * (SP_{i-1} - SP_i)$$

where,

- $R =$  Recovery rate assumption
- $DF_i =$  Risk-free discount factor from the USD swap curve for time  $T_0$  to  $T_i$
- $SP_i =$  Survival probability from  $T_0$  to  $T_i$
- $d_i =$  Accrual period from  $T_{i-1}$  to  $T_i$  (in years) calculated on an Actual/360 basis
- $n =$  Number of time periods

**Fixed Leg.**

The fixed coupon on the CDS ( $C$ ) is the premium that will be made on each payment date (if no default has occurred) until the maturity of the CDS.

This first component of the fixed leg is valued as:

$$C * \sum_{i=1}^n (DF_i * SP_i * d_i)$$

where,

- $C =$  CDS Coupon (premium)
- $DF_i =$  Risk-free discount factor from the USD swap curve for time  $T_0$  to  $T_i$
- $SP_i =$  Survival probability from  $T_0$  to  $T_i$
- $d_i =$  Accrual period from  $T_{i-1}$  to  $T_i$  (in years) calculated on an Actual/360 basis
- $n =$  Number of time periods

The other component of the fixed leg is the accrual value of the premium paid up until the day of default, when the default occurs between the set payment dates. The accrued payment is calculated under the assumption that the default, were it to happen, would occur in the middle of the payment dates (i.e.  $d_i/2$ ). As such, the accrual has to be further adjusted by the probability that default occurs after payment date  $i-1$ , but before payment date  $i$ .

Adding this second component of the fixed leg, we value the PV of the fixed leg as:

$$PV \text{ of fixed leg} = C * \sum_{i=1}^n (DF_i * SP_i * d_i) + C * \sum_{i=1}^n (DF_i * (SP_{i-1} - SP_i) * \frac{d_i}{2})$$

**Bootstrapping.** In practice, a bootstrapping procedure is used to derive the default intensities for a given period of time and, hence, build a curve of survival probabilities when the credit curve is not flat. Bootstrapping a credit curve starts with year 1, then year 2, etc. Data points for 1, 2, 3, 4, 5, 7 and 10 year maturities are used. Default intensities for intermediate maturities are derived from interpolation.

Equating the net present value (NPV) of the fixed and contingent legs to zero, the fair (par) spread or premium on a CDS is derived as:

$$S_{par} = \frac{(1 - R) \sum_{i=1}^n (DF_i) * (SP_{i-1} - SP_i)}{\sum_{i=1}^n (DF_i * SP_i * d_i) + \sum_{i=1}^n (DF_i * (SP_{i-1} - SP_i) * d_i / 2)}$$

A default intensity  $\lambda(1)$  for  $T=0$  to  $T=1$  is derived from using the data point (CDS spread) for period 1 as the par spread and using the assumed recovery rate. After finding  $\lambda(1)$ , take the CDS spread for period 2 and derive the  $\lambda(2)$  that sets the NPV of the two legs to zero for that period. Continuing this exercise for each subsequent period builds a curve of survival probabilities.

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