Cash Flow Equivalence

Introduction

This document is intended to demonstrate the level of cash flow equivalence between an Eris credit futures contract and a cleared or un-cleared OTC swap contract referencing the same underlying index and maturity.

Eris credit futures contracts replicate the cash flows and economics of cleared OTC Credit Index Default Swaps (CDS), as encompassed in the Eris Methodology™, such as those offered by ICE Clear Credit. By extension, replication of the cash flows and economics of un-cleared CDS is implied, provided matching daily settlement of mark-to-market of the un-cleared swap.

Eris Methodology - Summary

Prior to defining equivalence, below is a summary of the Eris methodology calculation of a futures price from the quotation price. The Futures price will be calculated daily for daily settlement price determination, and used as the basis for making variation margin calls.

\[
\text{Futures Price} = \text{‘A’} + \text{‘B’} = \text{‘C’}
\]

Where:

- All values are in the quoting convention of index points as defined in the contract specifications;
- \( A = 100 + (\text{clean price} + \text{accrued interest} - 100) \times \text{index factor}; \)
- \( B = \text{sum of all historical cash flows, and} \)
- \( C = \text{Cumulative Price Alignment Interest (“PAI”).} \)

The B and C components are calculated and applied by IFUS, and are not subject to negotiation by the counterparties.

Price Alignment Interest represents the interest that would be paid on any collateral posted under a bilateral CDS contract\(^1\). Cumulative PAI is the sum of all daily PAI calculations since the inception of the Futures contract.

Definition of Equivalence

The cash flow equivalence between Futures and CDS can be defined as:

\[
\Delta \text{Futures Price} = \Delta \text{‘A’} + \Delta \text{‘B’} = \Delta \text{‘C’}
\]

\(^1\) Cleared and Un-cleared OTC credit index default swaps are assumed to be executed under an ISDA Master Agreement and Credit Support Annex with a $0 threshold, meaning that any mark-to-market value must be collateralized.

Eris products listed on ICE exchanges are based on the Eris Methodology™, Eris’ product design for constructing capital-efficient futures that incorporates intellectual property, expertise and patent-pending innovations.
Where:

$\Delta A' = \text{the change in mark to market value (the change in clean price and accrued interest adjusted by the index factor as appropriate) of the CDS contract from the prior settlement date}$

$\Delta B' = \text{Sum of any coupon payments and/or credit event payments due on the current date}$

$\Delta C' = \text{Change in the cumulative PAI from the prior settlement date}$

**Daily Net Cash flows are always equivalent between Futures and CDS**

\[
\text{Daily Coupon and Credit Event Settlement Payments (CDS) + Daily Change in Collateral (CDS)} = \\
\text{Daily Change in Variation Margin (Futures)}
\]

Coupon and credit event settlement payments made throughout the life of a CDS impact the Net Present Value (NPV), but not the net cash flows of the CDS, when movement of collateral is taken into account.

Futures track the total value of a swap from contract inception. The daily settlement price of a Futures contract will not change dramatically on coupon payment dates, assuming credit spreads are static, and no credit events are settled on those days. This is because whilst the coupon payment that was previously included in the ‘A’ value of the daily settlement price has reset to 1 day of accrued interest (from approximately 90 days assuming quarterly coupon payments, resulting in a drop in the ‘A’ value, the coupon is now an historical cash flow, and therefore is now included in the ‘B’ value used to determine the daily settlement price.

As a result it is accurate to say that if:

a) credit spreads are held constant, and;
b) there are no credit events settling on the coupon date, and;
c) the day prior to the coupon payment was a valid business day

Then the daily change in the settlement price value will be equal to:

a) 1 day of accrued interest plus or minus
b) 1 day of price alignment interest$^2$

The coupons due on the coupon payment date accrue rather than being paid between counterparties.

Historical coupon and credit event settlement amounts will impact the value of Futures at a fixed value without any further credit spread sensitivity.

Given this explanation, we will demonstrate how the Futures contract has been designed to meet the above definition as closely as possible. Where the Futures contract does not meet the exact definition, detailed explanations will show why the differences may be considered minimal.

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$^2$ Price Alignment interest will be negative if the ‘A’ value from the previous business day was less than 100 index points, and positive if it was greater than 100 index points.

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Summary Comparison of CDS and Futures

1) Timing and Method of Cash Flows
   a. **CDS:** Known fixed payment amounts are paid by the buyer of protection to the seller of protections on a quarterly basis (“Payment Dates”) throughout the life of the transaction. In return for this consideration, the seller of protection agrees to compensate the buyer of protection upon the occurrence of a credit event. The default probability adjusted net present value of these projected future cash flows is exchanged between counterparties via the daily collateral process, according to the terms of the applicable Credit Support Annex.
   b. **Futures:** All cash flows are exchanged between counterparties through variation margin via the daily mark-to-market process administered by the Clearing House. This valuation process incorporates past fixed and credit event settlement amounts and the NPV of projected future cash flows.

2) Collateral and Variation Margin Treatment
   a. **CDS (Collateral):** Collateral posted under a bilateral Credit Support Annex belongs to the party posting the collateral; ownership does not transfer to the receiving party
   b. **Futures (Variation Margin):** Variation margin for cleared transactions (including Futures) legally belongs to the owner of the account where the variation margin resides, and can be withdrawn and reinvested at the owner’s discretion

3) Restructuring Credit Event for European index contracts
   a. **CDS:** For an OTC contract, the restructuring credit event is not automatically triggered by the ISDA DC declaration of the credit event, and the settlement contains optional actions that can result in a different price depending upon, for example, whether the buyer or seller of protection triggered the credit event.
   b. **Futures:** Futures will automatically trigger a restructuring credit event as though the buyer of protection had triggered. If the “Movement Option” is applicable for the corresponding CDS, because of a lack of auction bucket, it will be exercised for Futures.

As a result of the difference relating to the restructuring credit event for European index contracts, this document focusses solely on index contracts without a restructuring credit event trigger. A separate document will address the comparison of economics of the restructuring credit event trigger.

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3 Un-cleared OTC credit index default swaps are assumed to be executed under an ISDA Master Agreement and Credit Support Annex with a $0 Threshold, meaning that any mark-to-market value must be collateralized.

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Futures Mechanics - Overview

Prior to examining specific examples of coupon payment, credit event settlement amount payment and PAI, we will provide some brief background on the data that we will examine in detail. The data that we will use consists of the first 8 months of trading of the HY 22 index contract. This provides us with the coupon and credit event payments to demonstrate the cash flow mechanics of the swap contract that the Future replicates, and includes two weekdays on which both the swaps and futures clearing houses were closed.

The contract began trading on 03/27/2014. The quarterly coupon payments scheduled to be paid by the buyer of protection to the seller of protection in 2014 had payment dates of 20th June, 22nd September and 22nd December. Note that the September and December dates were adjusted to the 22nd, from 20th, because 20th September and 20th December were Saturdays, so coupons are paid on the next good business day.

<table>
<thead>
<tr>
<th>Date</th>
<th>Cash Flow (index pts)</th>
<th>Amount</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/29/14</td>
<td>-0.9107</td>
<td></td>
<td>Credit Event</td>
</tr>
<tr>
<td>06/20/14</td>
<td>1.2650</td>
<td></td>
<td>Coupon</td>
</tr>
<tr>
<td>09/22/14</td>
<td>1.2925</td>
<td></td>
<td>Coupon</td>
</tr>
<tr>
<td>12/22/14</td>
<td>1.2513</td>
<td></td>
<td>Coupon</td>
</tr>
</tbody>
</table>

Prior to the payment of the first coupon, a credit event occurred, an auction was held on 22nd May 2014, and the auction payments for CDS were settled on 29th May 2014.

As a result all coupon payments made are subject to the application of a factor of 0.99, instead of a factor of 1.00, reflecting the weighting of a single entity in the HY 22 index (the index is an equally weighted index of 100 reference entities). Figures for coupons in the cash flow table above have already been subjected to the application of the 0.99 factor.

We will now separately walk through the mechanics of the calculations for accrued interest/coupons, credit events and price alignment interest.
Mechanics of Coupon Payments

1. **Cleared CDS**: the coupon payments are included through adjustments in the margin calls issued the business day prior to the coupon being due, such that the coupon is transferred through the margin payment/receipt on the following business day.

2. **Futures**: the coupon accrues in the ‘A’ value up to and including the night prior to the payment date, and is then transferred from the ‘A’ value to the ‘B’ value at the start of business on the payment date. For example, if the final premium accrual day for a given period is on a Sunday, the coupon payments will be moved into the cash flow component of the futures price for Monday’s trading day, and therefore paid out through the variation margin transfer the following business day.

As the Eris methodology accrues daily interest on coupon payments in the ‘A’ value, on the day of a coupon payment any trades that occur will result in a settlement price that includes the fact that the coupon has been paid that day to the seller of protection.

A seller of protection that closes their position on the coupon payment date will have received the coupon through the ‘B’ value that is used to determine the price at which the position is closed. A seller of protection that opens a new position that same day will not receive the coupon as it has already been transferred to the ‘B’ historical cash flows value.

This timing difference creates a minor difference on coupon payments, specifically when the unadjusted coupon payment date is not a business day (such as a weekend date or a date upon which ICUS is closed).

This timing difference is due to the Cleared CDS accruing the interest due over the weekend into the margin call issued on Friday evening, so that the entire coupon is paid on the next business day. For Futures, the accrued interest amount that is used on the Friday is determined at the start of the business day, and only covers that trading day, and not the weekend. This to ensure that any open positions that are closed on that Friday receive only the interest up to that Friday, and do not overpay, by including the interest payable over the weekend.

**Example 1: HY 22 Index Coupon payment for June, 2014**

<table>
<thead>
<tr>
<th>Date</th>
<th>Dirty Price</th>
<th>CDS Coupon</th>
<th>Net</th>
<th>'A'</th>
<th>'B'</th>
<th>Net</th>
<th>Diff. (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/18/2014</td>
<td>0.5045</td>
<td>0.0000</td>
<td>0.5045</td>
<td>0.5045</td>
<td>0.0000</td>
<td>0.5045</td>
<td>0.0000</td>
</tr>
<tr>
<td>6/19/2014</td>
<td>(1.0939)</td>
<td>1.2650</td>
<td>0.1710</td>
<td>0.1711</td>
<td>0.0000</td>
<td>0.1710</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>6/20/2014</td>
<td>0.0629</td>
<td>0.0000</td>
<td>0.0629</td>
<td>(1.2296)</td>
<td>1.2650</td>
<td>0.0354</td>
<td>(0.0275)</td>
</tr>
<tr>
<td>6/23/2014</td>
<td>0.0525</td>
<td>0.0000</td>
<td>0.0524</td>
<td>0.0800</td>
<td>0.0000</td>
<td>0.0799</td>
<td>0.0275</td>
</tr>
</tbody>
</table>

The example above shows how ICE Clear Credit includes the full coupon amount as a separate payment to the variation margin in the cash flows calculated on 06/19/2014. Futures make the same adjustment as Cleared CDS, but at the start of business on 06/20/2014. In both cases, as the coupon payment had already been accrued on a daily basis since 03/20/2014 through the accrued interest calculation, and hence paid or received through the daily variation margin, the actual payment of the coupon is little more than an accounting adjustment in either case.

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On the coupon payment date (06/20/14), the change in variation margin for Futures ($0.0354) was driven almost entirely by changes in the clean price and accrued interest was not impacted by the occurrence of a coupon payment date.

We can calculate the value of the change in price due to accrued interest on the coupon date by taking the sum of the change in AI value plus the change in the ‘B’ value. As the ‘B’ value reflects historical cash flows, it increases by the coupon payment. The ‘A’ value drops by the same amount (-$1.2650), as the coupon payment is transferred from the ‘A’ value to the ‘B’ value, but the daily change drops by slightly less (-$1.2513) due to 1 day of accrued interest ($0.0138). If we add the clean price change and 1 day of accrued interest, we account for $0.0354.

The change for the CDS of $0.0629 is greater by $0.0275 since it includes 2 more days of accrual over the weekend through 6/22/2014.

PAI difference not shown above - please see the section “Mechanics of Price Alignment Interest” below, for a more detailed example including PAI.

**Example 2: HY 22 Index Coupon payment for September, 20 2014**

<table>
<thead>
<tr>
<th>Date</th>
<th>CDS</th>
<th>Futures</th>
<th>Diff. (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dirty Price</td>
<td>Coupon Net</td>
<td>'A' Net</td>
</tr>
<tr>
<td>9/18/2014</td>
<td>0.2352</td>
<td>0.0000</td>
<td>0.2352</td>
</tr>
<tr>
<td>9/19/2014</td>
<td>(1.1003)</td>
<td>1.2925</td>
<td>0.1923</td>
</tr>
<tr>
<td>9/22/2014</td>
<td>(0.3849)</td>
<td>0.0000</td>
<td>(0.3849)</td>
</tr>
<tr>
<td>9/23/2014</td>
<td>(0.4600)</td>
<td>0.0000</td>
<td>(0.4599)</td>
</tr>
<tr>
<td>9/24/2014</td>
<td>0.0966</td>
<td>0.0000</td>
<td>0.0966</td>
</tr>
</tbody>
</table>

The example above shows how the Eris methodology uses an accrued interest value at COB 09/19/2014 of 1.265 in its calculation of a settlement price (and hence used for margin calls). ICE Clear Credit includes the full coupon payment of 1.2925 in its settlement price on the same day.

The difference of 0.0274 is reversed the following day (09/22), when the Eris methodology updates the ‘B’ value at start of trading with the full coupon payment, and both Eris and ICE Clear Credit use 1 day of accrued interest. The timeline below helps to clearly demonstrate how and why the timings of these payments differ.
Operationally, the ICE Clear Credit settlement of mark-to-market variation is not due until the beginning of the following business day (8AM ET). This matches the timing when the Eris updated ‘B’ value is also settled.
Mechanics of Price Alignment Interest

A difference exists in the calculation of PAI between Futures and CDS on the day before and after a weekend, or other non-business day, due to a difference in the number of days of accrual that are used in the calculation.

1. **Cleared CDS**: the number of accrual days used to calculate the daily PAI at settlement represents the difference in calendar days between the current trading day and the next trading day. For example, the daily PAI calculation on a Friday (assuming that Thursday was a valid trading day) will use a 3 day accrual period, while the daily PAI calculation on the following Monday will use a 1 day accrual period.

2. **Futures**: the number of accrual days used to calculate the daily PAI at settlement represents the difference in calendar days between the current trading day and the most recent trading day. For example, the daily PAI calculation on a Friday (assuming that Thursday was a valid trading day) will use a 1 day accrual period, while the daily PAI calculation on the following Monday will use a 3 day accrual period.

The difference in methodology results from how a pre-existing position must be treated due to the timing of the updates to the PAI. For a position that is exited on a Friday, because the Eris methodology is updated that morning, the PAI must use 1 day for the accrual factor for PAI, otherwise the closed position would incorrectly earn the additional 2 days of PAI for the weekend period after the position was closed. At ICE Clear Credit the closed position would not be subject to the 3 days of PAI calculated at the close of that Friday.

Both processes use the same mark-to-market value, and Fed Funds Effective rate and publication date.

**Example 3: PAI calculation for 04/03/2014**

<table>
<thead>
<tr>
<th>Values as of COB 04/03/14</th>
<th>Cleared CDS</th>
<th>Futures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of MTM</td>
<td>04/02/2014</td>
<td>04/02/2014</td>
</tr>
<tr>
<td>MTM Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fed Funds Publication Date</td>
<td>04/03/2014</td>
<td>04/03/2014</td>
</tr>
<tr>
<td>Fed Funds Rate as of</td>
<td>04/02/2014</td>
<td>04/02/2014</td>
</tr>
<tr>
<td>Fed Funds Rate Used</td>
<td>0.08%</td>
<td>0.08%</td>
</tr>
<tr>
<td>Number of Days</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Paid/Collected Date</td>
<td>04/04/2014</td>
<td>04/04/2014</td>
</tr>
<tr>
<td>Daily PAI</td>
<td>0.00001982</td>
<td>0.00001982</td>
</tr>
</tbody>
</table>

The above shows how equivalence is achieved on days where both the prior and next calendar days are good, consecutive business days.

**Example 4: PAI calculation for 04/04/2014**

<table>
<thead>
<tr>
<th>Values as of COB 04/04/14</th>
<th>Cleared CDS</th>
<th>Futures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of MTM</td>
<td>04/03/2014</td>
<td>04/03/2014</td>
</tr>
<tr>
<td>MTM Value</td>
<td>107.796663333</td>
<td>107.796663333</td>
</tr>
<tr>
<td>Fed Funds Publication Date</td>
<td>04/04/2014</td>
<td>04/04/2014</td>
</tr>
</tbody>
</table>

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The above shows how on the day prior to a non-business day (in this case due to a weekend) results in a different number of days used in the calculation.

**Example 5: PAI calculation for 04/07/2014**

<table>
<thead>
<tr>
<th>Values as of COB 04/07/14</th>
<th>Cleared CDS</th>
<th>Futures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of MTM</td>
<td>04/04/2014</td>
<td>04/04/2014</td>
</tr>
<tr>
<td>MTM Value</td>
<td>107.796663333</td>
<td>107.796663333</td>
</tr>
<tr>
<td>Fed Funds Publication Date</td>
<td>04/07/2014</td>
<td>04/07/2014</td>
</tr>
<tr>
<td>Fed Funds Rate as of</td>
<td>04/04/2014</td>
<td>04/04/2014</td>
</tr>
<tr>
<td>Fed Funds Rate Used</td>
<td>0.08%</td>
<td>0.08%</td>
</tr>
<tr>
<td>Number of Days</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Paid/Collected Date</td>
<td>04/08/2014</td>
<td>04/08/2014</td>
</tr>
<tr>
<td>Daily PAI</td>
<td>0.00001723</td>
<td>0.00005169</td>
</tr>
</tbody>
</table>

On the following Monday the Futures contract includes, prior to open, the three days of PAI, whilst the Cleared CDS includes 1 day, reversing the difference from 04/04.
Mechanics of Credit Events

Credit Event Auction Settlement Dates:

1. **CDS:** CDS formally settles on a date determined as part of the Auction Settlement Terms, published by ISDA for each credit event, and is typically (but not guaranteed to be) between T+3 and T+5 of the auction date. The settlement value is reflected in the price of the CDS on T+1 and effectively settled on T+1 through the daily mark-to-market.

2. **Futures:** Settlement occurs on T+1, through the inclusion of the credit event settlement amount in the ‘B’ value, matching the timing of the respective cashflow in the CDS.

Credit event settlements and the associated economics differ slightly between CDS and Futures, due to the fact that once the settlement price for a credit event is known market participants begin to trade a new version of the CDS contract, where the weight of the defaulting reference entity is set to zero.

As a result during the period between the credit event auction date, and the credit event auction settlement date, there are two versions of the CDS contract that exist simultaneously - the original version contracts awaiting settlement of the credit event, and contracts referencing the new version, where the weight in the index of the reference entity that is the subject of the credit event auction has been set to zero, such that version two contracts are not eligible for settlement.

As a single Futures contract cannot track the change in value of two different CDS, unless the change in value of each of those CDS is the same, Futures is defined to always track the value of the most recent version of CDS.

To achieve this, and ensure only those Futures positions that were established prior to the credit event auction are eligible for settlement, the Futures settle the credit event T+1 from the auction date, and thereafter are economically equivalent to holding a position in the next version of the CDS contract (which as of T+1 from the auction date is the most liquid contract that trades in the OTC market). While CDS officially settles based upon the dates published in each credit event auction settlement terms (usually, but not always between T+3 and T+5), no cashflow occurs on that date since the auction amount is also settled on T+1 through the daily mark-to-market of the CDS.

On auction settlement date the old CDS contract is replaced with the next version of the index, which is marked less the settlement value of the defaulted component. That amount is in released from the
variation margin account and becomes the auction settlement amount - an accounting transfer that results in no net cashflow between contract holders.

With actual cashflow dates matching, the contracts remain economically equivalent.

For the period of time between the day after the credit event auction and the credit event settlement date, there will be a small difference in economic equivalence, for those participants that entered into a contract on or prior to the credit event auction date, due to the fact that the futures contract is tracking the economics of the next version of the CDS contract.

<table>
<thead>
<tr>
<th>Date</th>
<th>CDS</th>
<th>Futures</th>
<th>Diff. (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clean Price</td>
<td>AI</td>
<td>Coupon</td>
</tr>
<tr>
<td>5/20/2014</td>
<td>(0.2233)</td>
<td>0.0139</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/21/2014</td>
<td>0.1638</td>
<td>0.0139</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/22/2014</td>
<td>1.1028</td>
<td>0.0139</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/23/2014</td>
<td>0.1109</td>
<td>0.0417</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/26/2014</td>
<td>(0.0098)</td>
<td>0.0139</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/27/2014</td>
<td>0.1373</td>
<td>0.0139</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/28/2014</td>
<td>(0.0769)</td>
<td>0.0042</td>
<td>0.0000</td>
</tr>
<tr>
<td>5/29/2014</td>
<td>0.1366</td>
<td>0.0138</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

As seen in prior examples, the major differences on 5/23 and 5/26 are explained by the timing issue of coupon accrual on weekends. All remaining differences are due to the timing of when the Futures and CDS decrement their index factors to account for the default name.

Analysis of the daily differences as seen in the above table provides the following explanations.

1) **Accrued Interest**: between 05/22 and 05/27 the CDS is still accruing interest on the defaulted name, whereas the Futures contract is not. This difference amounts to 0.0001 + 0.0005 + 0.0001 + 0.0001 = 0.0008 from 05/22 to 05/27. This 0.0008 amount is a temporary difference, and resets on 05/28, when the CDS changes index factor. As we can see on the day that the Futures changed index factor, the accrual was 0.0050 (including adjustment for coupon rebate on the defaulted entity though auction settlement date), but the value was only 0.0042 when the CDS changed index factor (also reflecting the coupon rebate). The difference is the 0.0008 amount as described earlier.

2) **Clean Price**: Differences caused by the index factor also create differences in the price change attributable to the clean price. However for the same reason as for accrued interest, the sum of the differences over the 05/20 to 05/29 period is zero.

From this we can conclude that the timing of the credit event payment does not create material profit or loss relating to the cash flow timing.
Conclusion

For trades that are fully collateralized or cleared, coupon amounts that are paid out to the counterparties or accrued until maturity result (bar the minor discrepancies discussed in this paper) in the same cash flows and economic outcome for both parties.

In addition, it is worth highlighting that this conclusion is not impacted by individual counterparty funding costs for coupon payments because the coupon payments occur at the same points in time on Futures and CDS.
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**Appendix A: Daily Cash Flow Table, Futures and CDS**

<table>
<thead>
<tr>
<th>Date</th>
<th>CDS - Daily Cash Flow (Index Points)</th>
<th>Futures - Daily Cash Flow (Index Points)</th>
<th>Diff. (Net Cash Flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clean Price</td>
<td>Accrued Interest</td>
<td>Coupon</td>
</tr>
<tr>
<td>3/28/2014</td>
<td>0.1323</td>
<td>0.0417</td>
<td>0.0000</td>
</tr>
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### Table: Eris Credit Futures

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<tr>
<th>Date</th>
<th>CDS - Daily Cash Flow (Index Points)</th>
<th>Futures - Daily Cash Flow (Index Points)</th>
<th>Diff. Cash Flow</th>
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<th>CDS - Daily Cash Flow (Index Points)</th>
<th>Futures - Daily Cash Flow (Index Points)</th>
<th>Diff. (Net Cash Flow)</th>
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