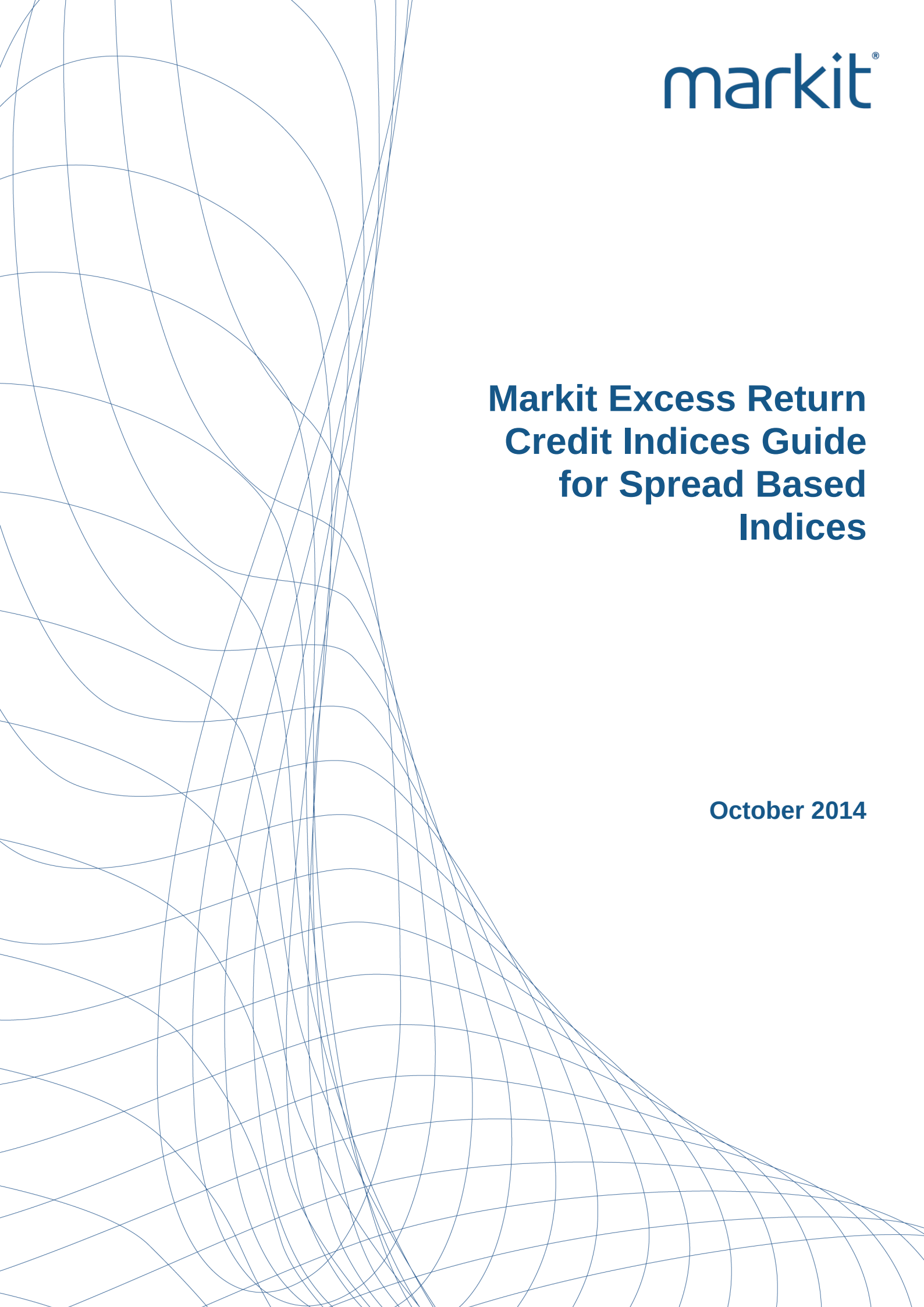

Markit Excess Return Credit Indices Guide for Spread Based Indices

October 2014

Contents

1 Introduction

This document explains the technical calculation of the Markit iTraxx / CDX® Excess Return Indices which are based on spread based underlying indices:

Markit iTraxx Europe Main 5-year EXCESS RETURN INDEX

Markit iTraxx Europe Crossover 5-year EXCESS RETURN INDEX

Markit iTraxx Asia ex-Japan IG 5-year EXCESS RETURN INDEX

Markit iTraxx Australia 5-year EXCESS RETURN INDEX

Markit iTraxx Japan 5-year EXCESS RETURN INDEX

Markit CDX.NA.IG 5-year EXCESS RETURN INDEX

These indices measure the performance of holding the respective on-the-run iTraxx / CDX CDS index contracts. The indices reflect a long credit position i.e. selling protection on the iTraxx / CDX default swap indices. It therefore replicates the behavior of a fictitious unfunded portfolio that buys one iTraxx / CDX CDS index contract. The portfolio is always invested in the on-the-run iTraxx / CDX CDS index series that it tracks - each time a new iTraxx / CDX CDS index series is published, due to the regular index roll (every March and September) or due to a credit event in a constituent of the current series, the CDS position in the reference portfolio is rolled into the on-the-run/reduced index position.

The base index level of Markit iTraxx Europe Main 5-year EXCESS RETURN INDEX, Markit iTraxx Europe Crossover 5-year EXCESS RETURN INDEX, Markit iTraxx Australia 5-year EXCESS RETURN INDEX and Markit iTraxx Japan 5-year EXCESS RETURN INDEX will be 100 at the launch of Series 7 of the iTraxx Europe Main, iTraxx Europe Crossover, iTraxx Australia, and iTraxx Japan indices respectively (i.e., 20 March 2007).

The base index level of the Markit iTraxx Asia ex-Japan IG 5-year EXCESS RETURN INDEX will be 100 at the launch of Series 8 of the iTraxx Asia ex-Japan IG index (i.e., 20 September 2007).

The base index level of the Markit CDX.NA.IG 5-year EXCESS RETURN INDEX will be 100 at the launch of Series 8 of the CDX.NA.IG index (i.e., 20 March 2007).

2 Index Calculation

2.1 Methodology

The Excess Return Indices measure the performance of holding the respective on-the-run iTraxx / CDX CDS index contracts.

The iTraxx Europe Main, iTraxx Europe Crossover, iTraxx Australia, iTraxx Japan, iTraxx Asia ex-Japan IG and CDX.NA.IG indices are spread based indices and are quoted in the market in spread terms. The spread equates uniquely to an upfront price given the fixed deal spread (coupon) for the swaps. This price is essentially the upfront value of entering into the credit default swap index contract.

The Excess Return Indices involve selling protection on the iTraxx / CDX credit default swap indices - the index return then reflects a long credit position. On the first trading day of the new on-the-run indices – on 20 March and 20 September if these days are business days[1], if not the next business day - the position in the off-the-run index is unwound and a position in the new series is entered into. The contracts on all spread based indices are sold and purchased at the official Markit mid-spread index levels of the relevant trading day. The Markit 17:00 London price for the Markit iTraxx Europe and Markit iTraxx Europe Crossover indices, the Markit 18:00 Tokyo price for the Markit iTraxx Asia ex-Japan IG, Markit iTraxx Australia and Markit iTraxx Japan indices, and the Markit 17:00 New York price for the Markit CDX.NA.IG index is used.

The indices reflect a protection seller's position and therefore receive a coupon on a quarterly basis. Any coupons paid are reinvested immediately into the respective index on the day they are paid.

2.2 Semi-annual index roll process

During the regular roll process the index return should reflect the value of exiting the long risk position in the old (i.e. off-the-run) iTraxx / CDX index contract and simultaneously entering the new (i.e. on-the-run) index contract at mid at the end of the first day of trading of the new index. Transacting at mid means that transaction costs are not included. Therefore, for spread based indices a roll transaction cost of 1% of the respective "old" series composite spread plus 1% of the respective "new" series composite spread, is applied.[2]

2.3 Index data and disruption

For Markit to be able to publish the daily Markit Short Excess Return index level the relevant iTraxx / CDX price must be published. In periods of market stress or disruption as well as in illiquid or fragmented markets preventing the publication of a daily Markit iTraxx/CDX price, Markit will publish a statement outlining the course of action due to the disruption on the Markit website www.markit.com/Product/Indices under the iTraxx News page and CDX News page.

In the event of a major structural change within the CDS market impacting the Excess Return indices calculation, Markit will confer with all relevant stakeholders and publish the outcome of any material change as well as any decisions taken at Markit's discretion that has led to the resulting methodology change.

[1] Relevant holiday calendar for all iTraxx Indices: http://www.markit.com/en/products/data/indices/credit-and-loan-indices/itraxx/itraxx-calendar.page?
CDX indices follows the SIFMA recommended a holiday schedule
Coupon payment dates are on Mar/Jun/Sep/Dec 20th, business day adjusted following.
All Coupons and recovery rates are available in the index documentation on www.markit.com

[2] Prior to September 2012 transaction costs were calculated as 1% of the respective "old" series coupon plus 1% of the respective "new" series coupon.

2.4 Index restatement

Index restatement follows the policy described in the Index restatement policy document, available on the Markit website www.markit.com

2.5 Index review

Index methodology reviews for the Excess Return indices outlined within this guide are performed on a periodic basis. Any material changes to the methodology governing the Excess Return indices are published on the Markit website www.markit.com/Product/Indices under the iTraxx News page and CDX News page.

3 Management of defaults in the index

When credit events occur, Markit announces that a new “reduced” contract will replace the current “full” contract as the official one. Markit does not determine credit events, but effectively credit events are treated in the Total Return Indices as an early roll into this new “reduced” contract.

3.1 Trigger event

Following a credit event in a constituent of the Markit iTraxx Europe Main, Markit iTraxx Europe Crossover, Markit iTraxx Asia ex-Japan IG, Markit iTraxx Australia, Markit iTraxx Japan or Markit CDX.NA.IG indices, the ISDA Determinations Committee votes to decide if a credit event has occurred for the entity and if an auction for the defaulted entity is to be held. If the outcome of this vote is positive, Markit publishes a new version of the index annex zero weighting the relevant entity i.e. the “reduced” index.

3.2 Procedure

For the Total Return Indices, the date on which the indices are rolled from the “full” index (with the defaulted name) to the “reduced” index (without the defaulted name) is usually done on the business day following the auction date. The exception being “restructuring” credit events where the contract will usually be rolled on the business day following the Event Determination Date (EDD). Due to the hardwiring of Credit Event Auctions into the ISDA Definitions, transaction costs are no longer reflected in the index calculation methodology, except in instances where “restructuring” credit events trigger the CDS.[3]

Following all determined credit events the “full” and the “reduced” index values are determined using the Markit Group Composite price as set out in 2.1 above.
The price for the “full” previous version on the business day following the auction date will be derived from the auction recovery rate and new “reduced” version price. For restructuring events the price for the “full” previous version on the business day following the EDD will be derived using the spread/upfront of the restructured entity and the new “reduced” version price. A transaction cost reflecting that the position on the restructured entity would not be unwound at mid would be determined according to the below process:

- For a calculation to be valid, Markit must observe valid bid/offer levels from more than five market participants for the restructured entity. The average bid/offer spread will be used to determine the price at which the restructured entity would be unwound and thus the relevant price to be used in the calculation of the derived price described above.
- The bid/offer spread will be capped at 10% of the Markit composite spread of the restructured entity.
- The minimum bid/offer spread will be 2% of the Markit composite spread of the restructured entity.
- If there is not sufficient valid bid/offer spreads available from market participants, the maximum bid/offer spread will be applied.

[3] In the unlikely event that an auction is not held following a constituent credit event and provided market condition warrant, Markit could at its discretion and following consultation with stakeholders include an appropriate transaction cost in the index reversioning methodology.

4 Appendix: Markit Excess Return Credit Index calculation methodology for spread based indices

In this appendix, S_t is the market spread of the current iTraxx / CDX series at day *t* for all spread based indices, i.e., the official iTraxx / CDX spread published by Markit Group at each closing of day *t*. Mid spreads are used.

4.1 Index calculation

The base index level is

- Set at 100 at the launch day of Series 7 of the iTraxx Europe Main, iTraxx Europe Crossover, iTraxx Australia, and iTraxx Japan indices (i.e., 20 March 2007) for the of Markit iTraxx Europe Main 5-year, Markit iTraxx Europe Crossover 5-year, Markit iTraxx Australia 5-year, and Markit iTraxx Japan 5-year EXCESS RETURN INDICES respectively,
- Set at 100 at the launch day of Series 8 of the iTraxx Asia ex-Japan IG index (i.e., 20 September 2007) for the Markit iTraxx Asia ex-Japan IG 5-year EXCESS RETURN INDEX, and
- Set at 100 at the launch day of Series 8 of the CDX.NA.IG index (i.e., 20 March 2007) for the Markit CDX.NA.IG 5-year EXCESS RETURN INDEX.

The total return index level I_t on day *t* is calculated as

$$I_t = I_{t-1}(1 + R_t^{CDS})$$

where

R_t^{CDS} is the daily return on day *t* of the iTraxx / CDX index spread.

$$R_t^{CDS} = \{CDS_{t-1}(S_{t-1}) - CDS_t(S_t) + Coupon_t$$

where

$CDS_t(S_t)$ is the mark-to-market value of the iTraxx / CDX CDS contract on day *t*, i.e., the dirty price for buying protection on the iTraxx / CDX index. The calculation of CDS_t is described in section Marking CDS to Market of this appendix.

$Coupon_t$ is the coupon paid on day *t* by the current iTraxx / CDX index, 0 if *t* is not a coupon day

When *t* is a roll date, the return is adjusted to account for the transaction costs during index roll as described below.

4.2 Index Rolls

In case of the regular semi-annual index rolls and in case of a roll into a reduced contract, the portfolio is rolled over and the return on the roll date is calculated in the usual way, as specified above, and an "excess return" is added to account for Bid / Ask trading cost.

For spread based indices, the excess return is the sum of:

- the change of value due to valuing the portfolio with the new series' price
- the cost of switching at *t* from the old series to the new one.

$$ExcessR_t^{CDS} =$$
$$CDS_t^{oldseries}\left(S_t^{oldseries}\right) - CDS_t^{newseries}\left(S_t^{newseries}\right) +$$
$$CDS_t^{newseries}\left(S_t^{newseries} - TC^{newseries}\right) - CDS_t^{oldseries}\left(S_t^{oldseries} + TC^{oldseries}\right)$$

where

$S_t^{oldseries}$ is the market spread of the old iTraxx / CDX series at day *t*

$TC^{oldseries}$ is the transaction cost of rolling out of the old series

$S_t^{newseries}$ is the market spread of the new iTraxx / CDX series at the roll day *t*

$TC^{newseries}$ is the transaction cost of rolling into the new series

$CDS_t^{newseries}\left(S_t^{newseries} - TC^{newseries}\right)$ is the mark-to-market value of the new series with adjusted spread of $S_t^{newseries} - TC^{newseries}$, survival probabilities calculated using adjusted spread

$CDS_t^{oldseries}\left(S_t^{oldseries} + TC^{oldseries}\right)$ is the mark-to-market value of the old series with adjusted spread of $S_t^{oldseries} + TC^{oldseries}$, survival probabilities calculated using adjusted spread

Note that on the roll date *t* the R_t^{CDS} is calculated using the mark-to-market value of the old iTraxx / CDX series at day *t-1* and day *t*, and on date *t+1* the R_{t+1}^{CDS} is calculated using the mark-to-market value of the new iTraxx / CDX series at day *t* and day *t+1*.

5 Marking CDS to Market[4]

The mark-to-market value of an iTraxx CDS contract is the difference between the present value of contingent payments on defaults minus the present value of all future fixed rate payment.

For this mark-to-market calculation the ISDA CDS Standard Model is used. More information regarding the model input factors used as well as the ISDA CDS Standard Model source code can be downloaded freely from: www.cdsmodel.com

An Upfront fee calculator based on the ISDA CDS Standard model is available on www.markit.com.

[4] The ISDA CDS Standard model has been used for mark-to-market calculations since March 2014.

6 Further information

- Further information regarding use of the Markit credit indices and glossary of key terms are available in the Markit Credit Index Primer located in the indices documentation section under Primers on www.markit.com/indices

- For contractual or content issues please refer to

  Markit

  Tel: 00800 6275 4800
  Fax: +44 20 7260 2001
  E-mail: support@markit.com
  Internet: www.markit.com

- For technical issues and client support please contact support@markit.com

- Formal complaints can be sent electronically to a specifically dedicated email address: complaints_indices@markit.com. Please note complaints_indices@markit.com should only be used to log formal complaints. For any general index enquiries, please contact Markit indices support group support@markit.com

- Licences and Data
  Markit owns all iTraxx, iTraxx SovX and CDX data and indices and the intellectual property rights therein. A licence is required to create and/or distribute any product that uses, is based upon or refers to any iTraxx, iTraxx SovX and CDX index or iTraxx, iTraxx SovX and CDX data.