



Markit Interest Rate Curve XML Specifications

Version 1.17

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Document Updates

This section lists the changes made to this document as of November 8th, 2014.

Below table outlines the changes to this document.

Change Date	Change Description
November 8, 2014	<ul style="list-style-type: none"> - Changed Section 3.2: Update source of data in table from BBA to IBA for LIBOR rates for USD, GBP, JPY, CHF - Changed Section 5.2: Update table with new column of Normal Publication Time, and updated Publication Deadline Time for JPY and CHF LIBOR rates
October 15, 2013	<ul style="list-style-type: none"> - Changes to section 5.2 for the SGD currency following the change made by The Association of Banks in Singapore (ABS) to deposit rates publication time.
September 09, 2013	<ul style="list-style-type: none"> - Changes to section 5.3 to clarify interest rate curve publication practices during public holidays relevant to a specific currency. - Changes to section 3.2 for the SGD currency following The Association of Banks in Singapore's (ABS) and the Singapore Foreign Exchange Markets Committee's (SFEMC) decision to discontinue the 2MO, 9MO and 1Y maturity points.
May 24, 2013	<ul style="list-style-type: none"> - Changes to section 3.2 for the USD, GBP and CHF currencies following BBA's decision to remove the 9MO maturity point for these currencies
October 29, 2010	<ul style="list-style-type: none"> - Removed section 5.7 that discussed the possibility of changing the method to access the rates data. Markit will continue to support the URL and method to download as described in this document
September 22, 2010	<ul style="list-style-type: none"> - Removed note on page 8 regarding the holiday convention of deposit and swap rates
September 17, 2009	<ul style="list-style-type: none"> - Fixed typo for JPY spot date
September 10, 2009	<ul style="list-style-type: none"> - Minor clarifications for AUD and NZD conventions
August 28, 2009	<ul style="list-style-type: none"> - Added 4 new currencies - Added Error Handling for file retrieval section
July 9, 2009	<ul style="list-style-type: none"> - Publication deadlines edited to be local to the respective reference city of the currency. See section 5.2
May 12, 2009	<ul style="list-style-type: none"> - Effectiveas of field will just be a date and will exclude time.
May 7, 2009	<ul style="list-style-type: none"> - Change in Chapter File Transmission based on the latest Interest Rates proposal.
May 5, 2009	<ul style="list-style-type: none"> - Updated section headings in Chapter 4
Apr 27, 2009	<ul style="list-style-type: none"> - CAD is fixed to have floatingpaymentfrequency of 3M
Apr 25, 2009	<ul style="list-style-type: none"> - The effective times for the different currencies are not final and will be discussed in a group call. File Availability (section 5.2) will be revised. - GBP MM DCC is fixed to ACT/365
Apr 20, 2009	<ul style="list-style-type: none"> - Removed references to USD in introduction and title - Added Valuation Scenarios for Non-Local Currency Trades
Apr 17, 2009	<ul style="list-style-type: none"> - Added information for multiple currencies
Mar 30, 2009	<ul style="list-style-type: none"> - Spot Date logic updated to be Trade Date + 2 weekdays
Mar 27, 2009	<ul style="list-style-type: none"> - Changed source for deposit rates to be BBA. - Added the publish time in the File Availability section.
Mar 26, 2009	<ul style="list-style-type: none"> - Re-phrased the File Availability time. - Language updates in other sections.

Chapter 1 Introduction

This chapter provides a brief introduction into the requirements for sourcing and publishing the interest rates to be used as input into the ISDA CDS Standard Model available at <http://www.cdsmodel.com>

1.1 Standardization of the Interest Rate Curve

As of April 8, 2009 the North American Corporate CDS Market is being quoted in Quoted/Conventional Spreads and Upfront with 100 or 500 Running Coupon. In order to value the new contracts consistently and in standardized manner, the industry needs to implement the ISDA CDS Standard Model. One of the inputs into the model is the Interest Rates Curve. Markit will be publishing Deposit and Swap Rates for the following currencies including the following USD, CAD, EUR, GBP, JPY, CHF, AUD, NZD, HKD, and SGD. The intention is that the Interest Rates published would also be applicable for CDX Indices and the European Corporate CDS as well.

1.2 Markit's Role

Markit will be the administrator and responsible authority for publishing the Interest Rates as covered by this document. Markit will source the interest rate curves from its existing snaps through various rates data providers. Finally, Markit will publish an XML file on its website which can be downloaded through an automated script or by directly load the provided web URL.

1.3 About Markit

Markit is a leading, global financial information services company with over 3,000 employees.

The company provides independent data, valuations and trade processing across all asset classes in order to enhance transparency, reduce risk and improve operational efficiency.

Its client base includes the most significant institutional participants in the financial marketplace.

Chapter 2 Project Overview

2.1 Purpose

This document details the XML message and definitions of the fields in the interest rate curve.

2.2 Definition of Terms Used

ACT/360 - Actual-360 Day Count Convention

30/360 - 30-360 Day Count Convention

Business Day Calendar - To avoid calendar maintenance, distribution, and agreement issues, all computations not involving JPY will assume a business day calendar of weekdays (Monday to Friday) only; weekends (Saturday, Sunday) will be the only non-business days. Computations involving JPY will use a holiday calendar published on cdsmodel.com (see references [1])

Chapter 3 Calculation Overview

This chapter provides an overview of the sourcing of interest rates and calculations used to derive yield curves.

3.1 Summary of the Calculations

Markit receives a feed from various data sources and snaps the values of the interest rate curves to its database.

3.2 Interest Rate Sourcing

In the body of the XML we will produce interest rates from the indicated sources for the following maturities:

Maturity	Type	USD Source	EUR Source	GBP Source	JPY Source	CHF Source	CAD Source
1MO	Deposit	IBA	EURIBOR	IBA	IBA	IBA	CDOR
2MO	Deposit	IBA	EURIBOR	IBA	IBA	IBA	CDOR
3MO	Deposit	IBA	EURIBOR	IBA	IBA	IBA	CDOR
6MO	Deposit	IBA	EURIBOR	IBA	IBA	IBA	CDOR
9MO	Deposit	<no rate>	EURIBOR	<no rate>	<no rate>	<no rate>	<no rate>
1Y	Deposit	IBA	EURIBOR	IBA	IBA	IBA	CDOR
2Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
3Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
4Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
5Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
6Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
7Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
8Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
9Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
10Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
12Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	<no rate>
15Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
20Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP
25Y	Swap	ICAP	<no rate>	ICAP	<no rate>	ICAP	<no rate>
30Y	Swap	ICAP	ICAP	ICAP	ICAP	ICAP	ICAP

The maturities for four additional currencies are as follows:

Maturity	Type	AUD Source	NZD Source	SGD Source	HKD Source
1MO	Deposit	BBR	BBR	SOR	HIBOR
2MO	Deposit	BBR	BBR	<no rate>	HIBOR
3MO	Deposit	BBR	BBR	SOR	HIBOR
6MO	Deposit	BBR	BBR	SOR	HIBOR
9MO	Deposit	<no rate>	<no rate>	<no rate>	<no rate>
1Y	Deposit	<no rate>	<no rate>	<no rate>	HIBOR
2Y	Swap	<no rate>	<no rate>	ICAP	ICAP
3Y	Swap	<no rate>	<no rate>	ICAP	ICAP
4Y	Swap	ICAP	ICAP	ICAP	ICAP
5Y	Swap	ICAP	ICAP	ICAP	ICAP
6Y	Swap	ICAP	<no rate>	ICAP	<no rate>
7Y	Swap	ICAP	ICAP	ICAP	ICAP
8Y	Swap	ICAP	<no rate>	<no rate>	<no rate>
9Y	Swap	ICAP	<no rate>	<no rate>	<no rate>
10Y	Swap	ICAP	ICAP	ICAP	ICAP
12Y	Swap	ICAP	<no rate>	ICAP	ICAP
15Y	Swap	ICAP	ICAP	ICAP	ICAP
20Y	Swap	ICAP	<no rate>	ICAP	<no rate>
25Y	Swap	ICAP	<no rate>	<no rate>	<no rate>
30Y	Swap	ICAP	<no rate>	<no rate>	<no rate>

Note: <no rate> means that for the corresponding maturity point no rates will be published.

The interest rates as provided can be used directly with the ISDA CDS Standard Model.

3.3 Yield Curve Calculation

3.3.1 Yield Curve Input

In order to interpolate the yield curve the following parameters are needed as inputs.

The conventions for the published currencies are as follows:

Field	EUR	USD	GBP	JPY	CHF	CAD
MM DCC	ACT/360	ACT/360	ACT/365	ACT/360	ACT/360	ACT/365
Floating DCC	ACT/360	ACT/360	ACT/365	ACT/360	ACT/360	ACT/365
Fixed DCC	30/360	30/360	ACT/365	ACT/365	30/360	ACT/365
spotdate	Trade Date + 2 weekdays (ignoring holidays)	Trade Date + 2 weekdays (ignoring holidays)	Trade Date (even if Trade Date is a holiday)	Trade Date + 2 weekdays (accounting for TYO calendar)	Trade Date + 2 business days (ignoring holidays)	Trade Date (even if Trade Date is a holiday)
fixedpaymentfrequency	1Y	6M	6M	6M	1Y	6M
floatingpaymentfrequency	6M	3M	6M	6M	6M	3M
baddayconvention	M	M	M	M	M	M
Holidays	none	none	none	TYO	none	none

The conventions for the four new currencies to be published

Field	HKD	SGD	AUD	NZD
MM DCC	ACT/365	ACT/365	ACT/365	ACT/365
Floating DCC	ACT/365	ACT/365	ACT/365	ACT/365
Fixed DCC	ACT/365	ACT/365	ACT/365	ACT/365
spotdate	Trade Date (even if Trade Date is a holiday)	Trade Date + 2 weekdays (ignoring holidays)	Trade Date (even if Trade Date is a holiday)	Trade Date + 2 weekdays (ignoring holidays)
fixedpaymentfrequency	3M	6M	6M	6M
floatingpaymentfrequency	3M	6M	6M	6M
baddayconvention	M	M	M	M
Holidays	none	none	none	none

Below please find a summary of the inputs into the yield curve

Name	Type	Description
Spot Date	Date	Refer table above for the respective currencies spot date
MM dcc	String	Money market day count convention, e.g. ACT/360
Swap DCC	String	Day count convention for swap curve
Float DCC	String	Day count convention for floating coupon payments
Swap IVL	String	Interval between fixed coupon payments
Float IVL	String	Interval between floating coupon payments
Bad Day Conv	String	Bad day convention for adjusting coupon payment dates, in the above example M represents Modified Following
Holidays	String	Calendar used when adjusting coupon dates

3.3.2 Yield Curve Calculation for Cash Rates

The cash rates are directly converted into discount factors (df) using ACT/360 day count convention using the following equation:

$$df_t = \frac{1}{1 + \text{depositRate}_t * \text{daycountfraction}_t}$$

As an example, consider the 3-Month LIBOR Rate. Assume today is Feb-03-2009, implying the spot date is Feb-05-2009. The maturity date for the 3-Month LIBOR Rate is May-05-2009, which is 89 days from today.

The *daycountfraction* is calculated as follows

$$\text{daycountfraction} = \frac{89\text{days}}{360\text{days}} = 0.247222$$

Suppose the depositRate is 0.0123375. The discount factor is then calculated as

$$df_t = \frac{1}{1 + \frac{89}{360} * 0.0123375} = 0.996959171$$

Zero Rates can then be derived from discount factors by the following formula

$$\text{zeroRate}_t = \frac{1}{df_t^{(1/tp)}} - 1$$

where tp = time from spot date to maturity date in years.

In the example then,

$$\text{zerorate}_t = \frac{1}{(0.996959171)^{(1/(89/365))}} - 1 = 0.01256814$$

3.3.3 Yield Curve Calculation for Swap Rates

The discount factor is defined in the same way as above:

$$df_t = \frac{1}{1 + \text{depositRate}_t * \text{daycountfraction}_t}$$

The 1-Month, 2-Month, 3-Month, 6-Month, 9-Month, and 1-Year discount factors have been calculated as above. The remaining discount factors can then be bootstrapped using an iterative process as described in the table below:

Inputs	Equation	Result
2Y Swap rate; 1M, 2M, 3M, 6M, 9M, 1Y discount factor;	$\sum_{i=1}^{N=1Y} [\text{coupon}_{(i)} \times df_{(i)}] + df_{(2Y)} = 1$	2Y discount factor
3Y Swap rate; 1M, 2M, 3M, 6M, 9M, 1Y, 2Y discount factor;	$\sum_{i=1}^{N=2Y} [\text{coupon}_{(i)} \times df_{(i)}] + df_{(3Y)} = 1$	3Y discount factor
4Y Swap rate; 1M, 2M, 3M, 6M, 9M, 1Y, 2Y, 3Y discount factor;	$\sum_{i=1}^{N=3Y} [\text{coupon}_{(i)} \times df_{(i)}] + df_{(4Y)} = 1$	4Y discount factor
.....

As part of this process, intermediate discount factors are needed to discount coupons that do not fall on swap or deposit maturity dates - for example the 2Y calculation requires that the coupon at 18 months be discounted. The intermediate discount factor, in this case for 18 months, is interpolated between the 1Y and 2Y discount factors

on the basis of a constant forward rate over the period from 1Y to 2Y i.e. the discount factor is log-linearly interpolated. The correct value for the forward rate is determined by an iterative search using Brent's method.

After this process, we have discount factors and zero rates for the 6 cash rates and 14 swap rates. The zero rates are then used as inputs in the converter

Note that the curve construction as described sets the value of the discount factor for the spot date to 1. Where a value is required for a day prior to spot (e.g. the curve date itself), this is obtained by extrapolating at the forward rate between spot and the first deposit maturity – thus the discount factor for the curve date is actually slightly greater than 1. To the extent that a user requires a present value calculated to the date to which the curve applies, rather than the spot date, this can be obtained simply by dividing the spot value by the curve date discount factor.

Chapter 4 XML Production

This chapter describes the interest rate XML to be delivered to the users of the Markit CDS Converter. The example given is for the USD currency.

4.1 XML Header

The header section of the XML encompasses a summary of the data provided in the rest of the document. Below, please find a sample of the header of the XML message.

<pre><?xml version="1.0" standalone="yes"?> <interestRateCurve> <effectiveasof>2009-02-03</effectiveasof> <currency>USD</currency> <baddayconvention>M</baddayconvention></pre>	<p>Change in the effectiveasof field, only date is displayed, time is excluded. This is to avoid time zone confusions for different currencies</p>
	<p>Currency can be USD, GBP, EUR, JPY, CHF, CAD, AUD, NZD, HKD, or SGD</p>

Below please find a description of the fields found in the header

Field	Type	Description
interestRateCurve	Element	Encapsulates the deposit and swap instruments for the curve.
effectiveasof	DateTime	Date and time from which the interest file takes effect in ISO 8601 format. The effectiveasof will always be the trade date
currency	String	Currency for the deposit and swap curve
baddayconvention	String	Convention for adjusting for Bad Days

Note: The character encoding will always be "UTF- 8"

4.2 XML Body

The constructed XML uses 20 curve points to display the information for the various maturities along the interest rate curves. For each of the 20 curve points we display the par rate of the interest curve, the maturity rate and the tenor.

Note: Number of curve points can differ based on currency, please review section 3.2

Below, please find a sample of the XML:

```

<deposits>
  <daycountconvention>ACT/360</daycountconvention>
  <snaptime>2009-02-02T21:00:00.000Z</snaptime>
  <spotdate>2009-02-05</spotdate>
  <calendars>
  <calendar>none</calendar>
  </calendars>
  <curvepoint>
    <tenor>1M</tenor>
    <maturitydate>2009-03-05</maturitydate>
    <parrate>0.004375</parrate>
  </curvepoint>
  <curvepoint>
    <tenor>2M</tenor>
    <maturitydate>2009-04-06</maturitydate>
    <parrate>0.0094375</parrate>
  </curvepoint>
  <curvepoint>
    <tenor>3M</tenor>
    <maturitydate>2009-05-05</maturitydate>
    <parrate>0.01225</parrate>
  </curvepoint>
  <curvepoint>
    <tenor>6M</tenor>
    <maturitydate>2009-08-05</maturitydate>
    <parrate>0.0176</parrate>
  </curvepoint>
  <curvepoint>
    <tenor>9M</tenor>
    <maturitydate>2009-11-05</maturitydate>
    <parrate>0.0192</parrate>
  </curvepoint>
  <curvepoint>
    <tenor>1Y</tenor>
    <maturitydate>2010-02-05</maturitydate>
    <parrate>0.0207</parrate>
  </curvepoint>
</deposits>
<swaps>
  <fixeddaycountconvention>30/360</fixeddaycountconvention>
  <floatingdaycountconvention>ACT/360</floatingdaycountconvention>
  <fixedpaymentfrequency>6M</fixedpaymentfrequency>
  <floatingpaymentfrequency>3M</floatingpaymentfrequency>
  <snaptime>2009-02-02T21:00:00.000Z</snaptime>
  <calendars>
  <calendar>none</calendar>
  </calendars>
  <spotdate>2009-02-05</spotdate>
  <curvepoint>
    <tenor>2Y</tenor>
    <maturitydate>2011-02-05</maturitydate>
    <parRate>0.01588</parRate>
  </curvepoint>

```

```
<curvepoint>
  <tenor>3Y</tenor>
  <maturitydate>2012-02-05</maturitydate>
  <parrate>0.01933</parrate>
</curvepoint>
<curvepoint>
  <tenor>4Y</tenor>
  <maturitydate>2013-02-05</maturitydate>
  <parrate>0.02184</parrate>
</curvepoint>
<curvepoint>
  <tenor>5Y</tenor>
  <maturitydate>2014-02-05</maturitydate>
  <parrate>0.02361</parrate>
</curvepoint>
<curvepoint>
  <tenor>6Y</tenor>
  <maturitydate>2015-02-05</maturitydate>
  <parrate>0.02531</parrate>
</curvepoint>
<curvepoint>
  <tenor>7Y</tenor>
  <maturitydate>2016-02-05</maturitydate>
  <parrate>0.02661</parrate>
</curvepoint>
<curvepoint>
  <tenor>8Y</tenor>
  <maturitydate>2017-02-05</maturitydate>
  <parrate>0.02765</parrate>
</curvepoint>
<curvepoint>
  <tenor>9Y</tenor>
  <maturitydate>2018-02-05</maturitydate>
  <parrate>0.02855</parrate>
</curvepoint>
<curvepoint>
  <tenor>10Y</tenor>
  <maturitydate>2019-02-05</maturitydate>
  <parrate>0.02927</parrate>
</curvepoint>
<curvepoint>
  <tenor>12Y</tenor>
  <maturitydate>2021-02-05</maturitydate>
  <parrate>0.03067</parrate>
</curvepoint>
<curvepoint>
  <tenor>15Y</tenor>
  <maturitydate>2024-02-05</maturitydate>
  <parrate>0.03212</parrate>
</curvepoint>
<curvepoint>
  <tenor>20Y</tenor>
  <maturitydate>2029-02-05</maturitydate>
  <parrate>0.03254</parrate>
</curvepoint>
```

```

<curvepoint>
  <tenor>25Y</tenor>
  <maturitydate>2034-02-05</maturitydate>
  <parrate>0.03246</parrate>
</curvepoint>
<curvepoint>
  <tenor>30Y</tenor>
  <maturitydate>2039-02-05</maturitydate>
  <parrate>0.03233</parrate>
</curvepoint>
</swaps>
</interestRateCurve>

```

Below find a definition of the fields found in the XML file.

Field	Type	Description
deposits	Element	Encapsulates the deposit instruments
swaps	Element	Encapsulates the swap instruments
calendars	Element	Encapsulates the holiday calendars
tenor	String	Maturity of Interest Rate Curve Input, the tenor is meant for readability purposes.
maturitydate	Date	Maturity Date for the Points of the Interest Rate Curve specified in yyyy-mm-dd format, this date is directly input into the ISDA CDS standard model. Maturity dates for deposit rates are adjusted for weekends (using the 'modified following' convention), maturity dates for spot rates are not adjusted.
parrate	Double	Raw Interest Rate Curve Point
daycountconvention	String	Day count convention for deposits. ¹
fixeddaycountconvention	String	Day count convention for fixed leg of swaps.
floatingdaycountconvention	String	Day count convention for floating leg of swaps.
fixedpaymentfrequency	String	Assumed frequency for the fixed leg payments for swap instruments
floatingpaymentfrequency	String	Assumed frequency for the floating leg payments for swap instruments
snaptime	Date/Time	The exact date and time that the interest rates were snapped into the Markit Data Warehouse
spotdate	Date	Please review section 3.3.1
calendar	String	Effective holiday calendar for the deposit or swap instruments

¹ Historically the USD interest rate file provided only the fixed day count convention, as of April 16, 2009, the InterestRates_USD_yyyymmdd.zip file contains a day count convention for fixed and floating leg.

Chapter 5 File Transmission

5.1 File Name

Files will be published for each of the following currencies: USD, GBP, EUR, JPY, CHF, CAD, AUD, NZD, SGD, and HKD

The file name will contain the currency and publish date of the rates in the file name. The syntax of the file name is as follows:

InterestRates_CCY_yyyymmdd.zip, where CCY is the currency and yyyymmdd publish date of the file

For example a EUR file published on May 7, 2009 would be named InterestRates_EUR_20090507.zip

Note: Files will be published every weekday (Monday to Friday) including holidays, as per the business day calendars definition in section 2.2.

5.2 File Publication

The below table defines the publish time and deadline times for each currency.

Currency	Reference City Time Zone	Deposit Rates Snap Time	Swap Rates Snap Time	Usual Publication Time	Publication Deadline Time
USD	New York local	11:00 London local	16:00 New York local	16:00 New York local	17:30 New York local
GBP	London local	11:00 London local	16:00 London local	16:00 London local	17:30 London local
EUR	Frankfurt local	11:00 Frankfurt local	16:00 Frankfurt local	16:00 Frankfurt local	17:30 Frankfurt local
JPY	Tokyo local	11:00 London local	16:00 Tokyo local	15:45 London local *	17:15 London local *
CHF	Zurich local	11:00 London local	16:00 Zurich local	16:45 Zurich local *	18:15 Zurich local *
CAD	Toronto local	12:00 Toronto local	16:00 Toronto local	16:00 Toronto local	17:30 Toronto local
AUD	Sydney local	11:00 Sydney local	16:00 Sydney local	16:00 Sydney local	17:30 Sydney local
NZD	Wellington local	11:00 Wellington local	16:00 Wellington local	16:00 Wellington local	17:30 Wellington local
SGD	Singapore local	12:00 London local	16:00 Singapore local	16:00 Singapore local	13:30 London local
HKD	Hong Kong local	12:00 Hong Kong local	16:00 Hong Kong local	16:00 Hong Kong local	17:30 Hong Kong local

Note: Snap times are local in the reference time zone of the city of the corresponding currency. Day light savings will be accounted for when snapping levels.

* ICE Benchmark Administration (IBA) was appointed by the UK Treasury as the new administrator of the London Interbank Offered Rate (LIBOR). IBA introduced a new licensing arrangement for the distribution of LIBOR rates within four hours of initial publication (11:45am London time) is liable for per user fees. As LIBOR rates are a component of the model for the following currencies: USD, GBP, JPY, CHF, in order that no per user fees apply to users of the Model, the publication times for JPY and CHF are delayed as follows:

- JPY usual publication time has moved from 16:00 Tokyo local time to 15:45 London local time (23:45 / 00:45 Tokyo local time *), SLA 17:15 London local time.
- CHF usual publication time has moved from 16:00 Zurich local time to 16:45 Zurich local time, SLA 18:15 Zurich local time.

Field definitions are as follows:

Currency	The currency for which rates will be published
Reference City Time Zone	The reference city time zone to identify end of day snaps for the corresponding currency.
Deposit Rates Snap Time	Fixed snap time for the deposit rates depending on the deposit rate source; LIBOR (USD, GBP, JPY, CHF), EURIBOR (EUR), CDOR (CAD), BBR (AUD), BBR (NZD), SOR (SGD), HIBOR (HKD)
Swap Rates Snap Time	Market close for the corresponding currency in the local time zone of the currency.
Publication Deadline Time	The publication deadline time of the Interest Rates file for the corresponding currency. Publication deadline times are as close as possible to the snap times and are based off the greater of the deposit and swap rates snap time. The time difference between the snap time and the publication deadline is to remedy any unforeseen issues with the snaps.

5.3 Files on Holidays and Weekends

Files will be published every weekday (Monday to Friday) irrespective of holidays [see References 1]. No files will be published on a Saturday and Sunday. The file published on Friday can be used for Saturday and Sunday.

During public holidays relevant for a specific currency, new deposit and/or swap rates may not be available. In such cases, Markit will publish the most recent deposit/swap data for that currency [Note: In some cases, the deposit and swap data will be from different days]. Similar to a normal day, the deposit and swap rates snap times will be provided in the files.

5.4 File Download

5.4.1 File Download Mechanism

The interest rate file will be available as a zipped archive from the following address https://www.markit.com/news/InterestRates_CCY_yyyymmdd.zip[†]. While several programming/scripting languages can be used to download the file, Curl is an easy to use utility for this purpose, example provided

Curl is available as a source code or a binary from the following website:

<http://curl.sourceforge.net/download.html>
<http://curl.haxx.se/download.html>

The first step is to download the curl program and the OpenSSL packages (that enable curl to transmit information securely with SSL) appropriate for your computer from one of these websites.

Once the curl program has been successfully installed along with the SSL library, you can automate the process of downloading the file from Markit as follows:

```
curl https://www.markit.com/news/InterestRates\_CCY\_yyyymmdd.zip > 'local_path'
```

The output from the file can be directed to a local file path (file path must include the file name).

[†] For historical consistency the USD rates files published at https://www.markit.com/news/InterestRates_yyyymmdd.zip will continue to be made available until May 31, 2009

5.4.2 File Download Error Messages

In order to provide validation around the currency and date combination, the service generating the interest rate XML file also generates error messages for the following error scenarios:.

Error Scenario	Example	Error Message Returned
Requesting Interest Rate Curves Not Yet Published	Requesting Date of 20090927 on 20090903	Interest Rates not available, please check date entered
Requesting a Date in Invalid Date Format	Requesting a Date of 2091203	Interest Rates not available, please check date entered
Requesting An Invalid Currency	Requesting a Currency of XHK	Interest Rates not available, please check currency entered
Database Server Busy		Database server is busy. Please try again later. Your request is currently number XX in the queue.
Database Server Error		Unable to generate interest rate report due to a date parsing error

If a database server busy error is encountered, please retry your download process at a later time.

5.5 File Usage

To understand how to implement the rates for a given currency on a given trade date:

Let T represent the trade date. The rates file for each currency will be published on T-1 weekday, and will be effective on T. It is implicitly assumed that counterparties always agree to use the same currency and the same trade date when computing cash settlement amount for a given trade [see reference 2].

As an example, refer to the table below for Trade Dates and the Rates file that need to be used for a sample week of March 9th, 2009. The below is applicable for each of the currencies.

Trade Date (T)	File Publication Date (T-1)
Mon 2009-03-09	Fri 2009-03-06
Tue 2009-03-10	Mon 2009-03-09
Wed 2009-03-11	Tue 2009-03-10
Thu 2009-03-12	Wed 2009-03-11
Fri 2009-03-13	Thu 2009-03-12

For further details regarding the availability of USD interest rate files and the snap times of interest rates on days surrounding holidays in 2009, please see the Appendix.

5.6 Exception Handling

Please refer to the Error Handling section of the Locked Interest Rates for Standard Converter document [see reference 2] for details on how to handle any specific error conditions.

References

[1] Standard North American Corporate CDS Converter Specification, September 3, 2009. Available at www.cdsmodel.com.

[2] Locked Interest Rates for the Standard Converter, May 8, 2009. Available at www.cdsmodel.com

Chapter 6 Contact

This section provides information about how to contact Markit for more information or support.

Address:

Markit

620 8th Avenue, 35th Floor

New York, NY 10018

United States

www.markit.com

For information not answered in this guide or any other issues/questions, please email

support@markit.com

Appendix: File Availability on Holidays

Date	Holiday Location *	Trade Date ⁺ T	File Publication Date T-1 [17:00 NY Time]	Deposit Snap Time [16:00 NY Time]	Swap Snap Time [16:00 NY Time]	Spot Date Trade Date +2 weekdays	File Name
Good Friday	U.K. U.S.	Fri April 10, 2009	Thu April 9, 2009	Thu April 9, 2009	Thu April 9, 2009	Tue April 14, 2009	InterestRates_USD_20090409.zip
Easter Monday	U.K.	Mon April 13, 2009	Fri April 10, 2009	Thu April 9, 2009	Thu April 9, 2009	Wed April 15, 2009	InterestRates_USD_20090410.zip
Day after Easter Monday		Tue April 14, 2009	Mon April 13, 2009	Thu April 9, 2009	Mon April 13, 2009	Thu April 16, 2009	InterestRates_USD_20090413.zip
May Day	U.K.	Mon May 4, 2009	Fri May 1, 2009	Fri May 1, 2009	Fri May 1, 2009	Wed May 6, 2009	InterestRates_USD_20090501.zip
Day after May Day		Tue May 5, 2009	Mon May 4, 2009	Fri May 1, 2009	Mon May 4, 2009	Thu May 7, 2009	InterestRates_USD_20090504.zip
Memorial Day/ Spring Bank Holiday	U.S. U.K.	Mon May 25, 2009	Fri May 22, 2009	Fri May 22, 2009	Fri May 22, 2009	Wed May 27, 2009	InterestRates_USD_20090522.zip
Day after Memorial Day/Bank Holiday		Tue May 26, 2009	Mon May 25, 2009	Fri May 22, 2009	Fri May 22, 2009	Thu May 28, 2009	InterestRates_USD_20090525.zip
Independence Day (observed)	U.S.	Fri Jul 3, 2009	Thu Jul 2, 2009	Thu Jul 2, 2009	Thu Jul 2, 2009	Tues Jul 7, 2009	InterestRates_USD_20090702.zip
Day after Independence Day		Mon Jul 6, 2009	Fri Jul 3, 2009	Fri Jul 3, 2009	Thu Jul 2, 2009	Wed Jul 8, 2009	InterestRates_USD_20090703.zip
Summer Bank Holiday	U.K.	Mon Aug 31, 2009	Fri Aug 28, 2009	Fri Aug 28, 2009	Fri Aug 28, 2009	Wed Sept 2, 2009	InterestRates_USD_20090828.zip
Day after Bank Holiday		Tue Sept 1, 2009	Mon Aug 31, 2009	Fri Aug 28, 2009	Mon Aug 31, 2009	Thu Sept 3, 2009	InterestRates_USD_20090831.zip
Labor Day	U.S.	Mon Sep 7, 2009	Fri Sep 4, 2009	Fri Sep 5, 2009	Fri Sep 5, 2009	Wed Sept 9, 2009	InterestRates_USD_20090904.zip
Day after Labor Day		Tue Sep 8, 2009	Mon Sep 7, 2009	Mon Sep 7, 2009	Fri Sep 5, 2009	Thu Sept 10, 2009	InterestRates_USD_20090907.zip
Columbus Day	U.S.	Mon Oct 12, 2009	Fri Oct 9, 2009	Fri Oct 10, 2009	Fri Oct 10, 2009	Wed Oct 14, 2009	InterestRates_USD_20091009.zip
Day after Columbus Day		Tue Oct 13, 2009	Mon Oct 12, 2009	Mon Oct 12, 2009	Fri Oct 10, 2009	Thu Oct 15, 2009	InterestRates_USD_20091012.zip
Veterans Day	U.S.	Wed Nov 11, 2009	Tue Nov 10, 2009	Tue Nov 10, 2009	Tue Nov 10, 2009	Fri Nov 13, 2009	InterestRates_USD_20091110.zip
Day after Veterans Day		Thu Nov 12, 2009	Wed Nov 11, 2009	Wed Nov 11, 2009	Tue Nov 10, 2009	Mon Nov 16, 2009	InterestRates_USD_20091111.zip
Thanksgiving Day	U.S.	Thu Nov 26, 2009	Wed Nov 25, 2009	Wed Nov 25, 2009	Wed Nov 25, 2009	Mon Nov 30, 2009	InterestRates_USD_20091125.zip
Day after Thanksgiving Day		Fri Nov 27, 2009	Thu Nov 26, 2009	Thu Nov 26, 2009	Wed Nov 25, 2009	Tues Dec 1, 2009	InterestRates_USD_20091126.zip
Christmas Day	U.S. U.K.	Fri Dec 25, 2009	Thu Dec 24, 2009	Thu Dec 24, 2009	Thu Dec 24, 2009	Tue Dec 29, 2009	InterestRates_USD_20091224.zip
Boxing Day	U.K.	Mon Dec 28, 2009	Fri Dec 25, 2009	Thu Dec 24, 2009	Thu Dec 24, 2009	Wed Dec 30, 2009	InterestRates_USD_20091225.zip
Day after Boxing Day		Tue Dec 29, 2009	Mon Dec 28, 2009	Thu Dec 24, 2009	Mon Dec 28, 2009	Thu Dec 31, 2009	InterestRates_USD_20091228.zip

* Holiday locations are defined as per the recommended close on holidays by SIFMA available at: <http://www.sifma.org/services/holidays.html>

⁺ All dates relative to trade date (T) are in weekdays.

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