Methodology for calculating the first dividend payment and the accrued interest for 2% Index-linked Treasury Stock 2035

This document sets out how to calculate the long first dividend payment and the accrued interest for 2% Index-linked Treasury Stock 2035. Examples of both calculations are provided. Further definitions and formulae for calculating accrued interest and prices from yields can be found in "Formulae for Calculating Gilt Prices from Yields", published in January 2002 and available on the DMO web site at:
www.dmo.gov.uk/gilts/public/technical/yldeqns_v2.pdf

First dividend calculation

After its routine consultation meetings with the Gilt-edged Market Makers and end investors in June 2002 the DMO announced that it would auction a new index-linked gilt on 10 July 2002 (for issue on 11 July 2002). As the dividend dates selected for the new bond were 26 January and 26 July it was decided that the bond should pay no dividend on 26 July 2002, but instead pay a long first dividend on 26 January 2003. This long first dividend was calculated using the following formula:

Long first dividend per £100 nominal

$$= \left(\frac{r_1}{s_1} + 1 \right) \times \frac{c}{2} \times \frac{RPID}{RPIB} \text{, rounded to the nearest 6th decimal place.}$$

Where:

$c =$ Real coupon per £100 nominal of the gilt.

$s_1 =$ Number of calendar days in the quasi-coupon period in which the <u>issue</u> date occurs.

$r_1 =$ Number of calendar days from the <u>issue</u> date to the next quasi-coupon date.

$RPID =$ The RPI which fixes the first dividend payment for the gilt i.e. the RPI scheduled to be published seven months prior to the month of the first dividend payment and relating to the month before that prior month (for example, if the first dividend payment on the gilt is in January then the RPI which fixes its value is the RPI for May of the previous year).

$RPIB$ The base RPI for the gilt i.e. the RPI scheduled to be published seven months prior to the month of issue of the gilt and relating to the month before that prior month (for example, if the gilt is issued in July then its base RPI is the RPI for November of the previous year).

So, the January 2003 dividend payment on 2% Index-linked Stock 2035 was calculated as follows:

$c =$ 2

$s_1 =$ Number of calendar days from 26 January 2002 to 26 July 2002
= 181

$r_1 =$ Number of calendar days from 11 July 2002 to 26 July 2002 = 15

RPID = The RPI for May 2002 = 176.2

RPIB The RPI for November 2001 = 173.6

Hence: Long first dividend per £100 nominal

$$= \left(\frac{15}{181} + 1\right) \times \frac{2}{2} \times \frac{176.2}{173.6}, \text{ rounded to nearest 6}^{\text{th}} \text{ decimal place}$$

$$= £1.099091$$

Accrued interest calculation

For long first dividends the period over which interest accrues is longer than six months. As a result, the dividend period spans two quasi-coupon periods. Since in most cases the number of days in two consecutive quasi-coupon periods are different, the rate at which interest accrues in these two periods will also be different. For example, in the case of the long first dividend on 2% Index-linked Treasury Stock 2035, the first quasi-coupon period (from 26 January 2002 to 26 July 2002) contains 181 days, whilst the second quasi-coupon period (from 26 July 2002 to 26 January 2003) contains 184 days. The difference in the rate of accrual between the two quasi-coupon periods means that separate formulae need to be defined for the accrued interest for these periods. As usual, in addition a separate formula is required for the calculation of accrued interest in the ex-dividend period. The three formulae

for calculating accrued interest on an index-linked gilt with a long first dividend appear below:

(i) If the settlement date occurs in the first quasi-coupon period then:

$$\text{Accrued interest per £100 nominal} = \frac{t}{s_1} \times \frac{c}{2} \times \frac{RPID}{RPIB}$$

(ii) If the settlement date occurs in the second quasi-coupon period and on or before the ex-dividend date then:

$$\text{Accrued interest per £100 nominal} = \left(\frac{r_1}{s_1} + \frac{r_2}{s_2} \right) \times \frac{c}{2} \times \frac{RPID}{RPIB}$$

(ii) If the settlement date occurs in the second quasi-coupon period after the ex-dividend date then:

$$\text{Accrued interest per £100 nominal} = \left(\frac{r_2}{s_2} - 1 \right) \times \frac{c}{2} \times \frac{RPID}{RPIB}$$

Where all terms are defined as above and in addition:

$t =$ Number of calendar days from the <u>issue</u> date to the settlement date in the first quasi-coupon period (this term only applies if the gilt settles in the first quasi-coupon period).

$s_2 =$ Number of calendar days in the quasi-coupon period after the quasi-coupon period in which the <u>issue</u> date occurs.

$r_2 =$ Number of calendar days from the quasi-coupon date after the <u>issue</u> date to the settlement date in the quasi-coupon period after the quasi-coupon period in which the <u>issue</u> date occurs (this term only applies if the gilt settles in the second quasi-coupon period).

For example, the accrued interest on 2% Index-linked Treasury Stock 2035 for settlement on 15 August 2002 would be calculated as follows:

$c =$ 2

$s_1 =$ Number of calendar days from 26 January 2002 to 26 July 2002 = 181

$r_1 =$ Number of calendar days from 11 July 2002 to 26 July 2002 = 15

$s_2 =$ Number of calendar days from 26 July 2002 to 26 January 2003 = 184

$r_2 =$ Number of calendar days from 26 July 2002 to 15 August 2002 = 20

RPID = The RPI for May 2002 = 176.2

RPIB = The RPI for November 2001 = 173.6

Accrued interest per £100 nominal $= \left(\dfrac{15}{181} + \dfrac{20}{184} \right) \times \dfrac{2}{2} \times \dfrac{176.2}{173.6}$

$$= £0.1944376950333….$$

NB: The accrued interest on all gilts is rounded to the nearest penny on the traded nominal amount for calculating settlement proceeds.

Published: 23 August 2002