THE ACTUAL/ACTUAL DAY COUNT FRACTION
Paper for Use with the ISDA Market Conventions Survey - 3rd June, 1999

1. Introduction

Although the actual/actual interest accrual convention is the recommended convention for euro-denominated bonds, there is some debate as to what actual/actual means. There are at least three different interpretations of actual/actual. For purposes of this note, these three interpretations are identified as:

(a) Actual/Actual (ISDA);

(b) Actual/Actual (ISMA); and

(c) Actual/Actual (AFB).

This note sets out ISDA's understanding of how these three approaches may be used to calculate payments by reference to certain examples.

2. Description

The difference between the ISDA, ISMA and AFB methods can be reduced to a consideration of the denominator to be used when calculating accrued interest. The numerator will, in all three cases, be equal to the actual number of days from and including the last coupon payment date (or period end date) to, but excluding, the current value date (or period end date) therefore:

(a) under the Actual/Actual (ISDA) approach, however, the denominator varies depending on whether a portion of the relevant calculation period falls within a leap year (for the portion of the calculation period falling within a leap year, the denominator is 366 and for the portion falling outside a leap year, the denominator is 365 - the actual number of days in the relevant portions is used as the numerator and the two fractions are added together);

(b) under Actual/Actual (ISMA), the denominator is the actual number of days in the coupon period multiplied by the number of coupon periods in the year (subject to exceptions in relation to irregular coupon periods); and

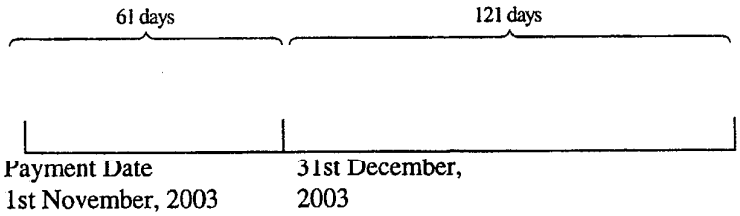
(c) under Actual/Actual (AFB), the denominator is either 365 (if the calculation period does not contain 29th February) or 366 (if the calculation period includes 29th February) - where a period of longer than one year is involved, two or more calculations are made: interest is calculated for each full year, counting backwards from the end of the calculation period, and the remaining initial stub period is treated in accordance with the usual rule. When counting backwards for this purpose, if the last day of the relevant period is 28th February, the full year should be counted back to the previous 28th February unless 29th February exists, in which case, 29th February should be used.

Note: The term calculation period, when used in this document, bears the same meaning given to that term in the 1991 ISDA Definitions: the period from, and including, one period end date (or the effective date) to, but excluding, the next period end date (or the termination date).

3. **Examples**

(a) *Semi-annual payment:*

Semi-annual payments
Notional: £10,000
Fixed Rate: 10%



ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{61}{365} + \frac{121}{366}\right) = £497.72$

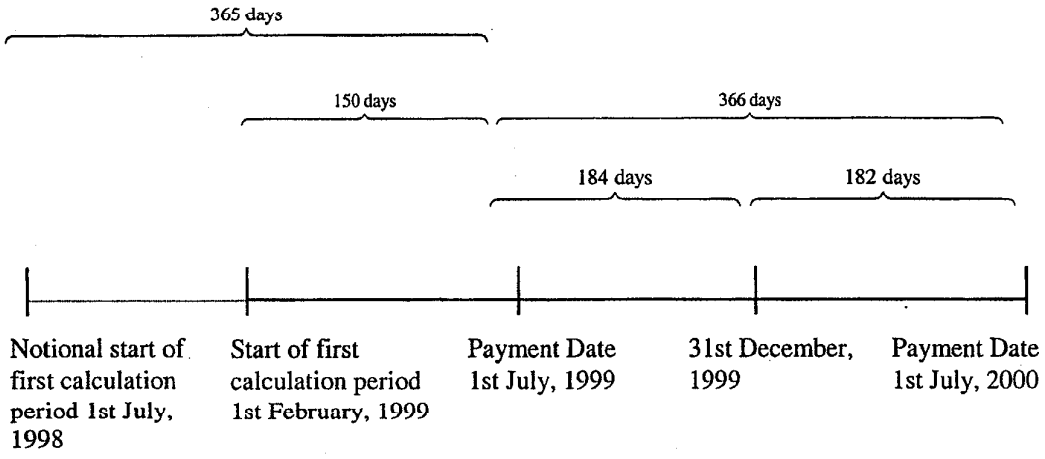
ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{182}{182 \times 2}\right) = £500.00$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{182}{366}\right) = £497.27$

(b) *Short first calculation period:*

Where the first calculation period is shorter than the "regular" calculation period for a transaction, interest accrual for that period using the ISMA approach is calculated as the actual number of days in that period divided by the actual number of days in a notional calculation period of the required "regular" length which ends on the last day of the first calculation period. In the example below, assume regular annual coupons.

Annual payments
Notional: £10,000
Fixed Rate: 10%



First Period:

ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{150}{365}\right) = £410.96$

ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{150}{365 \times 1}\right) = £410.96$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{150}{365}\right) = £410.96$

Second Period

ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{184}{365} + \frac{182}{366}\right) = £1{,}001.38$

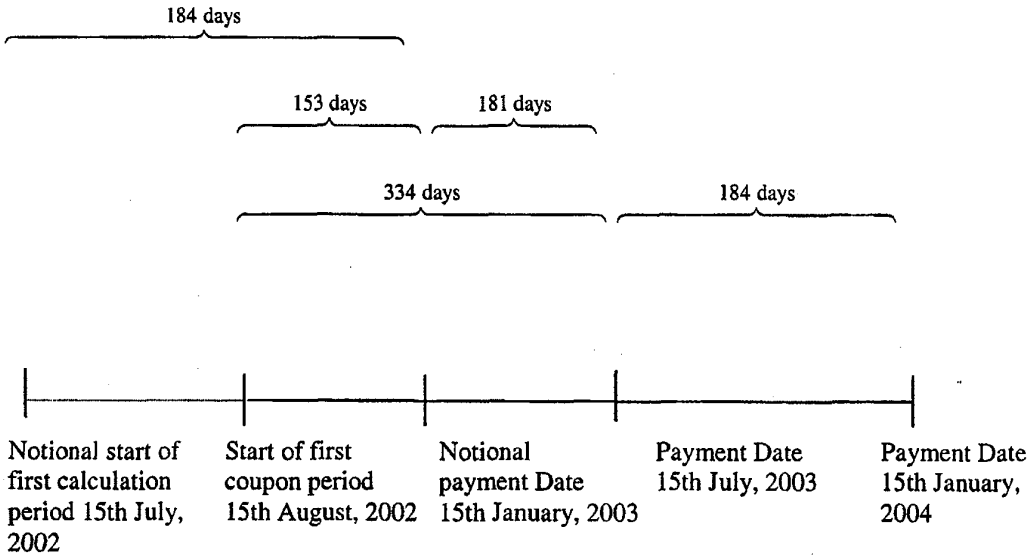
ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{366}{366 \times 1}\right) = £1{,}000.00$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{366}{366}\right) = £1{,}000.00$

(c) *Long first calculation period:*

Where the first calculation period is longer than the "regular" calculation period for a transaction, interest accrual for that first period using the ISMA approach is calculated as the sum of two calculations: one based on an assumed "regular" first calculation period (counting backwards from the last day of the first calculation period), giving a notional payment date, and the second, using the same approach as for a short initial calculation period in relation to the part of the actual calculation period which falls before the notional payment date.

Annual payments
Notional: £10,000
Fixed Rate: 10%



First Period:

ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{334}{365}\right) = £915.07$

ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{181}{181 \times 2} + \frac{153}{184 \times 2}\right) = £915.76$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{334}{365}\right) = £915.07$

Second Period

ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{170}{365} + \frac{14}{366}\right) = £504.00$

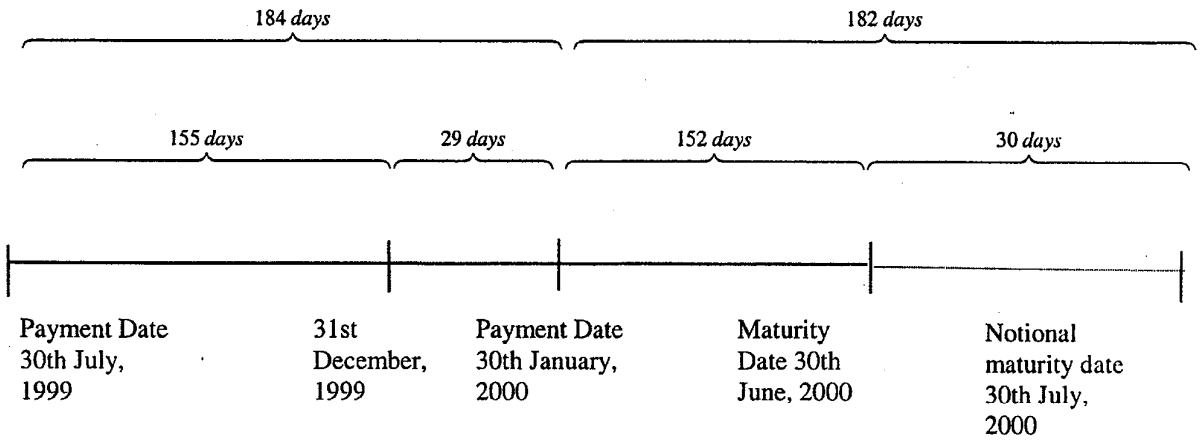
ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{184}{184 \times 2}\right) = £500$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{184}{365}\right) = £504.11$

(d) *Short final calculation period:*

Where the final calculation period is shorter than the "regular" calculation period, interest accrual for that period using the ISMA approach is calculated as the actual number of days in that period divided by the actual number of days in a notional calculation period of the required "regular" length which starts on the first day of the final calculation period. This example is used for illustration, despite the European Bond Commission's recommendation against irregular final coupon periods.

Semi-annual payments
Notional: £10,000
Fixed Rate: 10%



Penultimate Period:

ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{155}{365} + \frac{29}{366}\right) = £503.89$

ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{184}{184 \times 2}\right) - £500.00$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{184}{365}\right) = £504.11$

Final Period

ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{152}{366}\right) = £415.30$

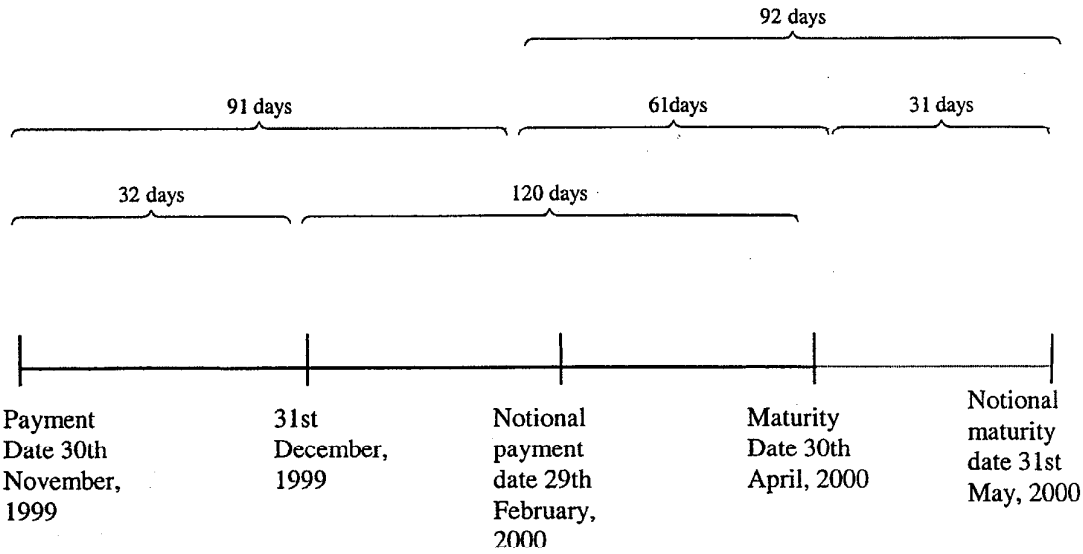
ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{152}{182 \times 2}\right) = £417.58$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{152}{366}\right) = £415.30$

(e) *Long final calculation period:*

Where the final calculation period is longer than the "regular" calculation period for a transaction, interest accrual using the ISMA approach for that final period is calculated as the sum of two calculations: one based on an assumed "regular" final calculation period (counting forwards from the first day of the final calculation period, giving a notional payment date, and the second, using the same approach as for a short final calculation period in relation to the part of the actual calculation period which falls after the notional payment date. This example is used for illustration, despite the European Bond Commission's recommendation against irregular final coupon periods.

Quarterly payments
Notional: £10,000
Fixed: 10%



ISDA Method: $£10{,}000 \times 10\% \times \left(\frac{32}{365} + \frac{120}{366}\right) = £415.54$

ISMA Method: $£10{,}000 \times 10\% \times \left(\frac{91}{91 \times 4} + \frac{61}{92 \times 4}\right) = £415.76$

AFB Method: $£10{,}000 \times 10\% \times \left(\frac{152}{366}\right) = £415.30$