



PWLB lending facility

Formula for calculating premium / discounts on variable rate loans

Premium / Discounts on variable rate loans are calculated from the following formula –

$$\frac{il(D2-D1)-(id(D2-D1))(1+il(D1))}{(1+id(D2-D1))}$$

where id = discount rate / 36500

il = loan rate / 36500

$D1$ = days since last payment

$D2$ = number of days in current period

Discount rate - this is the rate (taken from the set of rates applying to loans agreed before 12:30 on 20 October 2010) for the same interest repayment period as the loan being repaid.

Loan rate – this is rate currently applying to the loan being repaid i.e. the rate applied at the previous fixing date.

Note – if a loan is prematurely repaid on an interest payment date the premium / discount will be zero.

Worked example

Loan to be repaid on 2 October 2015

Discount rate – 0.76% (rate determined at 09:30 on 2 October 2015)

Loan rate – 0.76% (rate determined at 09:30 on last fixing date – 28 September 2015)

Roll over period – 6 monthly

Amount to be repaid - £5,000,000.00

$$id = 0.76 / 36500 = 0.0000208219178$$

$$il = 0.76 / 36500 = 0.0000208219178$$

$$D1 = 4 \quad (28 \text{ September to 2 October 2015})$$

$$D2 = 182 \quad (28 \text{ September 2015 to 28 March 2016})$$

Premium discount factor

$$= \frac{0.0000208219178(178) - (0.0000208219178(178))(1+0.0000208219178(4))}{(1+0.0000208219178(178))}$$

$$= \frac{0.0037063013699 - (0.0037063013699)(1+0.0000832876712)}{(1+0.0037063013699)}$$

$$= \frac{0.0037063013699 - (0.0037063013699)(1.0000832876712)}{(1.0037063013699)}$$

$$= \frac{0.0037063013699 - 0.0037066100591}{1.0037063013699}$$

$$= \frac{-0.0000003086892}{1.0037063013699} = -0.0000003075493$$

If the result is negative a discount is allowed and if the result is positive a premium is payable. To find the amount payable, simply multiply the factor by the amount to be repaid and round to the nearest penny -

$$= £5,000,000.00 * -0.0000003075493 = £-1.5377465 = £-1.54$$

In this case a discount of £1.54 is allowed.

The formula for calculating premium / discounts on variable rate loans is the present value of principal and interest to the next interest payment date, when the sum could notionally be re-lent at then current rates. In order to minimise the amount of premium charged when a premature repayment cannot be made on an interest payment date (because it falls on a non-banking day) it is generally better to make the premature before the interest payment date.

For example, a loan of £2,000,000 cannot prematurely repay on Sunday 1 March. The effect of making the premature repayment on 27 February and 2 March is summarised below -

Repayment Date	Previous Payment	Loan Rate	Discount Rate	Principal Repaid	Accrued Interest	Premium Charged
27/02/2015	01/09/2014	1.63	0.66	£2,000,000.00	£15,987.40	£105.72
02/03/2015	01/03/2015	1.57	0.67	£2,000,000.00	£86.03	£8,994.16