

BERR

Department for Business
Enterprise & Regulatory Reform

CONSUMER CREDIT DIRECTIVE

Worked Examples of Full and
Partial Early Repayments

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INDICATIVE WORKED EXAMPLES OF FULL AND PARTIAL EARLY REPAYMENT CALCULATIONS

(The formulae used in the calculations can be found in Chapter 12 of BERR's consultation document on the implementation of the Consumer Credit Directive and at the end of this document.)

Medium term, medium value loan

A loan of £5,000 is repayable by 48 monthly instalments of £134.57, starting one month after 1 March 2009 (the relevant date). The monthly repayments include interest and all other charges included in the total charge for credit. Thus total amount repayable = £134.57 x 48 = £6,459.36. The total charge for credit = £6,459.36 – £5,000 = £1,459.36.

The debtor gives notice requesting early settlement to take place immediately after payment of the 12th instalment (i.e. after one year) so that the settlement date is 1 March 2010.

Assuming that no charges are excluded from the calculation of the rebate under regulation 3(2) of the Consumer Credit (Early Settlement) Regulations 2004, the APR on the loan required for the calculation of the rebate is 14.0% per annum.

Since the instalments are exact numbers of calendar months from the settlement date, under the Consumer Credit (Total Charge for Credit) Regulations 1980 the periods are calculated in months, counting each month equal to one-twelfth of a year. Hence, for the purposes of the formula in Regulation 4(1) of the Consumer Credit (Early Settlement) Regulations 2004

$$\begin{aligned}A_1 &= 5,000 \\B_1 &= 134.57 = B_2 = \dots = B_{48} \\r &= 14.0/100 = 0.140 \\m &= 1 \\n &= 12 \\a_1 &= 1 \text{ (working in periods of whole years)} \\b_1 &= 11/12 \\b_2 &= 10/12 \\b_3 &= 9/12 \\&\vdots \\b_{11} &= 1/12 \\b_{12} &= 0/12 = 0\end{aligned}$$

Then the amount owing at the settlement date, immediately after payment of the 12th instalment, is: $5,000 \times (1.140)^1 - (134.57 \times 1.140^{(11/12)} + 134.57 \times 1.140^{(10/12)} + \dots + 134.57 \times 1.140^{(1/12)} + 134.57 \times 1.140^{(0/12)})$

$$= 5,700.00 - (151.74 + 150.10 + 148.47 + 146.85 + 145.26 + 143.68 + 142.12 + 140.58 + 139.05 + 137.54 + 136.05 + 134.57)$$

$$= 5,700.00 - 1,716.01 = \text{£}3,983.99$$

Example 1 - Full early settlement, no additional interest charged

If full early settlement is being made and the creditor opts not to add on any additional interest payment, then the amount for full early settlement would be £3,983.99 and the rebate in this case would be £860.53; this is calculated by deducting the early settlement figure of

£3,983.99 from the total payments outstanding after the date assumed for calculating the rebate which is £4,844.52 (= 36 x £134.57).

Example 2 - Full early settlement, one month's additional interest charged

If the creditor opts to levy an additional month's interest then the amount for full early settlement would be £3,983.99 x 1.140^(1/12) = £4,027.73. In this case the rebate would be £4,844.52 – £4,027.73 = £816.79.

Example 3 - Partial early settlement, no additional interest charged

If a partial early repayment of £1,000 is made at the settlement date and the creditor opts not to add on any additional interest payment, then P_T = £1,000 leaving £3,983.99-£1,000 = £2,983.99 as the outstanding amount to be repaid.

Same term, reduced future repayments of credit

If the borrower has asked for the repayment term to be kept the same and that the reduced future repayments of credit should be of equal amount, then the revised future repayment amounts E_x can be calculated using the rescheduled payments formula , where

$$\begin{aligned}
 S - P_T &= 2,983.99 \\
 E_1 &= E_2 = \dots = E_{36} \\
 r &= 14.0/100 = 0.140 \\
 q &= 36 \\
 e_1 &= 1/12 \\
 e_2 &= 2/12 \\
 e_3 &= e/12 \\
 &: \\
 e_{35} &= 35/12 \\
 e_{36} &= 36/12
 \end{aligned}$$

Then the revised repayments after the settlement date would be:

$$\begin{aligned}
 2983.99 &= E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{35}/1.140^{(35/12)} + E_{36}/1.140^{(36/12)} \\
 &= E_1 \times (0.98914 + 0.97840 + \dots + 0.68238 + 0.67497) \text{ (since } E_1 = E_2 = \dots = E_{36}) \\
 &= E_1 \times 29.60496
 \end{aligned}$$

$$\text{So } E_1 = 2983.99/29.60496 = \text{£}100.79$$

(In this case, as the payment term remains the same, and all the repayments are to remain equal, this is the same result as multiplying the original repayment by the ratio of the loan outstanding after partial repayment to that outstanding before partial repayment ie new repayment = £134.57 x 2,983.99/3,983.99 = £100.79.)

The rebate in this case would be £216.08; this is calculated by deducting the partial early settlement figure of £1,000.00 together with the total payments now outstanding (= 36 x £100.79) from the total payments outstanding after the settlement date had partial repayment not taken place (= 36 x £134.57).

Reduced future term, same repayments of credit as before partial repayment

If the borrower opts to keep the same repayment amounts as before the partial repayment then the outstanding term will be shortened. In this case the number of repayments, T, needs to be determined such that

$$E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{T-1}/1.140^{((T-1)/12)} + E_T/1.140^{(T/12)}$$

$$< 2983.99 < E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_T/1.140^{(T/12)} + E_{T+1}/1.140^{((T+1)/12)}$$

where $E_1 = E_2 = \dots = E_T$

For $T = 25$, $E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{24}/1.140^{((T-1)/12)} + E_{25}/1.140^{(T/12)}$
 $= E_1 \times 21.75898 = 134.57 \times 21.75898 = 2928.11$

For $T = 26$, $E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{25}/1.140^{((T-1)/12)} + E_{26}/1.140^{(T/12)}$
 $= E_1 \times 22.51182 = 134.57 \times 22.51182 = 3029.42$

Hence, in this case $T = 25$.

$$E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{24}/1.140^{(24/12)} + E_{25}/1.140^{(25/12)} = E_1 \times 21.75898$$

$$= 134.57 \times 21.75898 = 2928.11,$$

leaving a remaining payment of $\pounds 2,983.99 - \pounds 2,928.11 = \pounds 55.88$ if paid at the date of settlement. If the outstanding amount is paid at a later date then the amount would be increased with interest at 14% per annum. Thus if paid as a final repayment after 26 months, the payment would be $\pounds 55.68 \times 1.140^{(26/12)} = \pounds 74.23$.

The timing and hence the amount of this remaining repayment would affect the calculation of the amount of rebate as follows:

If a payment of $\pounds 55.88$ is made at the date of settlement, the rebate will be $\pounds 424.39$. This is calculated by deducting the partial early settlement figure of $\pounds 1,000.00$ together with the total payments now outstanding ($= 25 \times \pounds 134.57 + \pounds 55.88$) from the total payments outstanding after the settlement date had partial repayment not taken place ($= 36 \times \pounds 134.57$).

If, instead, a payment of $\pounds 74.23$ is made as the 26th repayment, the rebate will be $\pounds 406.04$. This is calculated by deducting the partial early settlement figure of $\pounds 1,000.00$ together with the total payments now outstanding ($= 25 \times \pounds 134.57 + \pounds 74.23$) from the total payments outstanding after the settlement date had partial repayment not taken place ($= 36 \times \pounds 134.57$).

Example 4 - Partial early settlement, one month's additional interest charged

If the borrower wishes to repay $\pounds 1,000$ and opts to keep the same repayment term but the creditor opts to levy an additional month's interest, and the borrower pays this additional charge in addition to the $\pounds 1,000$ partial repayment, then the calculations for future repayments are all the same as in the case above where no additional interest is levied. However, the partial repayment with interest actually made is $\pounds 1,000 \times 1.140^{(1/12)} = \pounds 1,010.98$. In this case the rebate would be $\pounds 36 \times 134.57 - 36 \times \pounds 100.79 - 1010.98 = \pounds 205.10$.

If the borrower wishes to pay $\pounds 1,000$ in total, including any additional interest charge levied by the lender, then $P_T = \pounds 1,000/1.140^{(1/12)} = \pounds 989.14$, leaving $\pounds 3,983.99 - \pounds 989.14 = \pounds 2,994.85$ as the outstanding amount to be repaid.

Same term, reduced future repayments of credit

If the borrower has asked for the repayment term to be kept the same and that the reduced future repayments of credit should be of equal amount, then the revised future repayment amounts E_x can be calculated as follows:

$$2994.85 = E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{35}/1.140^{(35/12)} + E_{36}/1.140^{(36/12)}$$

$$= E_1 \times (0.98914 + 0.97840 + \dots + 0.68238 + 0.67497) \text{ (since } E_1 = E_2 = \dots = E_{36})$$

$$= E_1 \times 29.60496$$

$$\text{So } E_1 = 2994.85/29.60496 = \text{£}101.16$$

(In this case, as the payment term remains the same, and all the repayments are to remain equal, this is the same result as multiplying the original repayment by the ratio of the loan outstanding after partial repayment to that outstanding before partial repayment ie new repayment = $\text{£}134.57 \times 2,994.85/3,983.99 = \text{£}101.16$.)

The rebate in this case would be $\text{£}202.76$; this is calculated by deducting the partial early settlement figure of $\text{£}989.14$ plus interest of $\text{£}10.86$ together with the total payments now outstanding ($= 36 \times \text{£}101.16$) from the total payments outstanding after the settlement date had partial repayment not taken place ($= 36 \times \text{£}134.57$).

Reduced future term, same repayments of credit as before partial repayment

If the borrower opts to keep the same repayment amounts as before the partial repayment then the outstanding term will be shortened. In this case the number of repayments, T, needs to be determined such that

$$E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{T-1}/1.140^{((T-1)/12)} + E_T/1.140^{(T/12)} < 2994.85 < E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_T/1.140^{(T/12)} + E_{T+1}/1.140^{((T+1)/12)}$$

where $E_1 = E_2 = \dots = E_T$

$$\text{For } T = 25, E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{24}/1.140^{(24/12)} + E_{25}/1.140^{(25/12)} = E_1 \times 21.75898 = 134.57 \times 21.75898 = 2928.11$$

$$\text{For } T = 26, E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{25}/1.140^{(25/12)} + E_{26}/1.140^{(26/12)} = E_1 \times 22.51182 = 134.57 \times 22.51182 = 3029.42$$

Hence, in this case $T = 25$.

$$E_1/1.140^{(1/12)} + E_2/1.140^{(2/12)} + \dots + E_{24}/1.140^{(24/12)} + E_{25}/1.140^{(25/12)} = E_1 \times 21.75898 = 134.57 \times 21.75898 = 2928.11,$$

leaving a remaining payment of $\text{£}2,994.85 - \text{£}2,928.11 = \text{£}66.74$ if paid at the date of settlement. If the outstanding amount is paid at a later date then the amount would be increased with interest at 14% per annum. Thus if paid as a final repayment after 26 months, the payment would be $\text{£}66.74 \times 1.140^{(26/12)} = \text{£}88.66$.

The timing and hence the amount of this remaining repayment would affect the calculation of the amount of rebate as follows:

If a payment of $\text{£}66.74$ is made at the date of settlement, the rebate will be $\text{£}413.53$. This is calculated by deducting the partial early settlement figure of $\text{£}1,000.00$ together with the total payments now outstanding ($= 25 \times \text{£}134.57 + \text{£}66.74$) from the total payments outstanding after the settlement date had partial repayment not taken place ($= 36 \times \text{£}134.57$).

If, instead, a payment of $\text{£}88.66$ is made as the 26th repayment, the rebate will be $\text{£}391.61$. This is calculated by deducting the partial early settlement figure of $\text{£}1,000.00$ together with the total payments now outstanding ($= 25 \times \text{£}134.57 + \text{£}88.66$) from the total payments outstanding after the settlement date had partial repayment not taken place ($= 36 \times \text{£}134.57$).

Examples recalculated if date of settlement used previously were the date of notification

If the creditor receives a request from the debtor for early settlement immediately after payment of the 12th instalment and regulation 5(a) applies (making the settlement date 28 days after the debtor's notice is received) then the settlement date will be 29 March 2010.

Under the Consumer Credit (Total Charge for Credit) Regulations, since the periods involved are no longer an exact number of months (or weeks), the periods must be counted in years and days (or weeks where the periods are an exact number of weeks). Hence, for the purposes of the formula in regulation 4(1) of the Consumer Credit (Early Settlement) Regulations 2004

$$A_1 = 5,000$$

$$B_1 = 134.57 = B_2 = \dots = B_{48}$$

$$r = 14.0/100 = 0.140$$

$$m = 1$$

$$n = 12$$

$a_1 = 393$ days = 1 year 28 days (working in periods of years and days, since not a whole number of weeks)

$$b_1 = 0$$
 years 362 days

$$b_2 = 0$$
 years 332 days

$$b_3 = 0$$
 years 301 days = 43 weeks

$$b_4 = 0$$
 years 271 days

$$b_5 = 0$$
 years 240 days

$$b_6 = 0$$
 years 209 days

$$b_7 = 0$$
 years 179 days

$$b_8 = 0$$
 years 148 days

$$b_9 = 0$$
 years 118 days

$$b_{10} = 0$$
 years 87 days

$$b_{11} = 0$$
 years 56 days = 8 weeks

$$b_{12} = 0$$
 years 28 days = 4 weeks

Then the amount owing at the settlement date of 29 March 2010 is –

$$5,000 \times (1.140)^{(1+28/365.25)} - (134.57 \times 1.140)^{(362/365.25)} + 134.57 \times 1.140^{(332/365.25)} + 134.57 \times 1.140^{(301/365.25)} + 134.57 \times 1.140^{(271/365.25)} + 134.57 \times 1.140^{(240/365.25)} + 134.57 \times 1.140^{(209/365.25)} + 134.57 \times 1.140^{(179/365.25)} + 134.57 \times 1.140^{(148/365.25)} + 134.57 \times 1.140^{(118/365.25)} + 134.57 \times 1.140^{(87/365.25)} + 134.57 \times 1.140^{(8/52)} + 134.57 \times 1.140^{(4/52)}$$

$$= 5,757.54 - (153.23 + 151.59 + 149.97 + 148.31 + 146.67 + 145.05 + 143.49 + 141.91 + 140.39 + 138.84 + 137.31 + 135.93)$$

$$= 5,757.54 - 1,732.69 = \text{£}4,024.85$$

Example 5 - Full early settlement, no additional interest charged

If full early settlement is being made and the creditor opts not to add on any additional interest payment, then the amount for full early settlement would be £4,024.85 and the rebate in this case would be £819.67; this is calculated by deducting the early settlement figure of £4,024.85 from the total payments outstanding after the date assumed for calculating the rebate which is £4,844.52 (=36 x £134.57).

Example 6 - Full early settlement, one month's additional interest charged

If the creditor opts to levy an additional 30 days interest then the amount for full early settlement would be £4,024.85 x 1.140^(30/365.25) = £4,068.40. In this case the rebate would be £4,844.52 – £4,068.40 = £776.12.

Example 7 - Partial early settlement, no additional interest charged

If a partial early repayment of £1,000 is made at the settlement date and the creditor opts not to add on any additional interest payment, then $P_T = £1,000$ leaving $£4,024.85 - £1,000 = £3,024.85$ as the outstanding amount to be repaid.

Same term, reduced future repayments of credit

If the borrower has asked for the repayment term to be kept the same and that the reduced future repayments of credit should be of equal amount, then the revised future repayment amounts E_x can be calculated using the rescheduled payments formula, where

$$\begin{aligned} S - P_T &= 3,024.85 \\ E_1 &= E_2 = \dots = E_{36} \\ r &= 14.0/100 = 0.140 \\ q &= 36 \\ e_1 &= 0 \text{ years } 3 \text{ days} \\ e_2 &= 0 \text{ years } 33 \text{ days} \\ e_3 &= 0 \text{ years } 64 \text{ days} \\ &\vdots \\ e_{34} &= 1008 \text{ days} = 144 \text{ weeks} \\ e_{35} &= 1039 \text{ days} \\ e_{36} &= 1067 \text{ days} \end{aligned}$$

Then the revised repayments after the settlement date would be:

$$\begin{aligned} 3024.85 &= E_1/1.140^{(3/365.25)} + E_2/1.140^{(33/365.25)} + E_3/1.140^{(64/365.25)} + \dots + E_{34}/1.140^{(144/52)} + \\ &E_{35}/1.140^{(1039/365.25)} + E_{36}/1.140^{(1067/365.25)} \\ &= E_1 \times (0.99892 + 0.98823 + 0.97730 + \dots + 0.69569 + 0.68885 + 0.68197) \text{ (since } E_1 = E_2 = \dots = E_{36}) \\ &= E_1 \times 29.89433 \end{aligned}$$

$$\text{So } E_1 = 3,024.85/29.89433 = £101.18$$

(In this case, as the payment term remains the same, and all the repayments are to remain equal, this is broadly the same result as multiplying the original repayment by the ratio of the loan outstanding after partial repayment to that outstanding before partial repayment ie new repayment = $£134.57 \times 3024.85/4024.85 = £101.14$.)

The rebate in this case would be £202.04; this is calculated by deducting the partial early settlement figure of £1,000.00 together with the total payments now outstanding (= $36 \times £101.18$) from the total payments outstanding after the settlement date had partial repayment not taken place (= $36 \times £134.57$).

Reduced future term, same repayments of credit as before partial repayment

If the borrower opts to keep the same repayment amounts as before the partial repayment then the outstanding term will be shortened. In this case the number of repayments, T , needs to be determined such that

$$\begin{aligned} E_1/1.140^{(3/365.25)} + E_2/1.140^{(33/365.25)} + E_3/1.140^{(64/365.25)} + \dots + E_{T-1}/1.140^{((T-1)/365.25)} + \\ E_T/1.140^{(T/365.25)} \\ < 3024.85 < E_1/1.140^{(3/365.25)} + E_2/1.140^{(33/365.25)} + E_3/1.140^{(64/365.25)} + \dots + E_T/1.140^{(T/365.25)} + \\ E_{T+1}/1.140^{((T+1)/365.25)} \\ \text{where } E_1 = E_2 = \dots = E_T \end{aligned}$$

For payments until and including the 25th payment on 1 April 2012, $T = 25$ payments and payment period of 733 days giving

$$E_1/1.140^{(3/365.25)} + E_2/1.140^{(33/365.25)} + \dots + E_{25}/1.140^{(733/365.25)}$$

$$= E_1 \times 21.75898 = 134.57 \times 21.97194 = 2956.76$$

For $T = 26$, $E_1/1.140^{(3/365.25)} + E_2/1.140^{(33/365.25)} + \dots + E_{25}/1.140^{((T-1)/12)} + E_{26}/1.140^{(T/12)}$

$$= E_1 \times 22.51182 = 134.57 \times 22.73177 = 3059.02$$

Hence, in this case there would be 25th payments of £134.57 leaving a remaining payment of £3,024.85 – £2,956.76 = £68.09 if paid at the date of settlement. If the outstanding amount is paid at a later date then the amount would be increased with interest at 14% per annum. Thus if paid as a final repayment after 26 months, the payment would be £68.09 x 1.140^(763/365.25) = £89.53.

The timing and hence the amount of this remaining repayment would affect the calculation of the amount of rebate as follows:

If a payment of £68.09 is made at the date of settlement, the rebate will be £412.18. This is calculated by deducting the partial early settlement figure of £1,000.00 together with the total payments now outstanding (= 25 x £134.57 + £68.09) from the total payments outstanding after the settlement date had partial repayment not taken place (= 36 x £134.57).

If, instead, a payment of £89.53 is made as the 26th repayment, the rebate will be £397.71. This is calculated by deducting the partial early settlement figure of £1,000.00 together with the total payments now outstanding (= 25 x £134.57 + £89.53) from the total payments outstanding after the settlement date had partial repayment not taken place (= 36 x £134.57).

Example 8 - Partial early settlement, one month's additional interest charged

If the borrower wishes to repay £1,000 and opts to keep the same repayment term but the creditor opts to levy an additional 30 days interest then the calculations for future repayments are all as in the case above where no additional interest is levied. However, the partial repayment actually made is £1,000 x 1.140^(30/365.25) = £1,010.82. In this case the rebate would be £36 x 134.57 – 36 x £101.18 – 1010.82 = £191.22.

Current rebate formula for full early repayment (to be retained)

$$\sum_{i=1}^m A_i(1+r)^{a_i} - \sum_{j=1}^n B_j(1+r)^{b_j}$$

where:

A_i = the amount of i th advance of credit

B_j = the amount of the j th repayment of credit

r = the annual rate equivalent of the APR/100 (ie if rate of interest is 12%, $r = 0.12$)

m = the number of advances of credit made before the settlement date

n = the number of repayments of credit made before the settlement date

a_i = the time between the i th advance of credit and the settlement date expressed in years and days, or whole weeks or months, as appropriate, and

b_j = the time between the j th repayment of credit and the settlement date expressed in years and days, or whole weeks or months, as appropriate

settlement date = up to 28 days from date of notification of early repayment.

Proposed rebate formula for partial early repayment

$$\text{Rebate} = F - \sum_{x=1}^q E_x - P_T$$

where:

F = the total of the repayments of credit that would fall due for payment after the settlement date if early settlement did not take place

$\sum_{x=1}^q E_x$ = total of repayments that remain to be made after partial repayment

E_x = the amount of x th repayment of credit after time T

q = the number of loan instalment repayments to be made after the settlement date T

P_T = amount of the early partial repayment to be made at time T, net of any additional 30 day/one month interest payment.

Proposed formula for calculating rescheduled payments

$$S - P_T = \sum_{x=1}^q E_x (1+r)^{e_x}$$

where:

S = amount that remains to be paid calculated at the settlement date (the figure given by the first formula)

P_T = amount of the early partial repayment to be made at time T, net of any additional 30 day/one month interest charge

q = the number of loan instalment repayments to be made after the settlement date T

E_x = the amount of x th repayment of credit after time T

r = the annual rate equivalent of the APR/100 (ie if rate of interest is 12%, $r = 0.12$)

e_x = the time from time T to payment of the x th repayment, expressed in years and days, or whole weeks or months, as appropriate.