Floating-rate repo conventions

Many repos pay repo rates that are linked to indexes that will be refixed one or more times during the terms of the transactions, which means the final Repurchase Prices will not be known until the final applicable fixings.

Floating-rate repos require the monitoring and recording of the floating-rate indexes, sometimes over extended periods. In order to avoid operational error, it is best practice to affirm the Repurchase Price of floating-rate repos ahead of the Repurchase Date. This task can be automated through the use of third-party affirmation and contract-compare services. The use of such third-party services is recommended as best practice.

1.1 Overnight index-linked repos

Many repo transactions have repo rates that are linked to an overnight index (OI) such as EONIA, eg the repo rate is EONIA + 10bp.

1.1.1 How is the repo rate compounded?

The return on OI-linked repos is rolled over and paid as part of the Repurchase Price on the Repurchase Date (R). Many OI-linked repos are not compounded daily. Instead, an arithmetic average is calculated. For a floating-rate repo with a day count of *n*:

$$\text{Repurchase Price} = \text{Purchase Price}\left(1+\frac{\left(\frac{(R_1.D_1)+(R_2.D_2)+\ldots+(R_n.D_n)}{n}\right)n}{100.B}\right)$$

where R_1 *is the per annum index fixing for day 1*
R_2 *is the per annum index fixing for day 2*
R_n *is the per annum index fixing for day n*
D_1 *is the number of days to which index fixing* R_1 *applies (normally 1 for a weekday and 3 for a weekend)*
D_2 *is the number of days to which index fixing* R_2 *applies*
D_n *is the number of days to which index fixing* R_n *applies*
n is the number of days in the term of the transaction (ie day count)
B is the annual basis (ie assumed number of days in the year)

Where the term of a repo crosses one or more non-business days (eg a weekend), the OI fixing on the last business day before the non-business day(s) is applied to the non-business day(s), eg Friday's fixing will be applied to the Saturday and Sunday of a normal weekend.

1.1.2 What rates are used in the calculations?

On the day before the Repurchase Date (R-1), it is usual practice to send settlement instructions to the appropriate (I)CSD. However, the OI for R-1 (which is the last fixing needed for the Repurchase Price to be calculated) is fixed after close of business, which may or may not be too late to send the necessary settlement instructions to the relevant (I)CSD in time for the repurchase to be made next day, on the Repurchase Date (R).

If the fixing of the OI is <u>not</u> too late, then Method 1 below is used. Method 1 is best practice.

Example of Method 1 for a 1W EUR 100 million repo priced at EONIA flat

	day count	EONIA fixing	EONIA applied	payment	
Thu 01-Dec	1	1.10%	1.10%		
Fri 02-Dec	3	1.05%	1.05%		
Mon 05-Dec	1	1.03%	1.03%		
Tue 06-Dec	1	1.02%	1.02%		
Wed 07-Dec	1	0.95%	0.95%		crystallisation day
Thu 08-Dec				20,138.89	

$$\text{Repurchase Price} = 100{,}000{,}000 \left(1 + \frac{\left(\frac{1.10 + (1.05 \times 3) + 1.03 + 1.02 + 0.95)}{7} \right) \times 7}{100 \times 360} \right) = 100{,}020{,}138.89$$

If the fixing of the OI is too late, then Method 2 below is used. Method 2 has traditionally been used in the cross-border market, where it has not always been possible to send instructions to the (I)CSDs on R-1 in time for settlement the next day. Instead, the OI fixing on R-2 is also applied to R-1, in place of the actual fixing that will take place on R-1. Method 2 is becoming less common as settlement technology improves.

Example of Method 2 for a 1W EUR 100 million repo priced at EONIA flat

	day count	EONIA fixing	EONIA applied	payment	
Thu 01-Dec	1	1.10%	1.10%		
Fri 02-Dec	3	1.05%	1.05%		
Mon 05-Dec	1	1.03%	1.03%		
Tue 06-Dec	1	1.02%	1.02%		crystallisation day
Wed 07-Dec	1	0.95%	0.95%		
Thu 08-Dec				23,333.33	

$$\text{Repurchase Price} = 100{,}000{,}000 \left(1 + \frac{\left(\frac{1.10 + (1.05 \times 3) + 1.03 + (1.02 \times 2)}{7} \right) \times 7}{100 \times 360} \right) = 100{,}023{,}333.33$$

Note that, under Method 2, the fixing on 7 December is not used. Instead, the fixing on 6 December is used again. The latter is said to be the “crystallisation day”.

In Method 1, the sequence of EONIA fixings is said to be “crystallised” into a fixed rate on the Repurchase Date. In Method 2, the sequence of EONIA fixings is said to be crystallised into a fixed rate two days before the Repurchase Date.

It is possible, but now rare, to apply more than one crystallisation day. For example, in Method 2, the EONIA fixing on 5 December could be applied also to 6 and 7 December. This would be described as crystallisation on R-3 and two crystallisation days.

Under Method 2, there will obviously be a discrepancy between the Repurchase Price that is actually calculated and settled by the parties, and the Repurchase Price that would have been paid had it been possible to apply the correct OI fixings for each and every day. When interest rates and market volatility are generally low, such discrepancies are insignificant, particularly for very short-term transactions, and will tend to be written off by the parties. However, at higher interest rate levels and/or for longer-term transactions, this may not be the case and parties may decide to make a retrospective reimbursement for the difference between the actual and correct Repurchase Prices. Such a provision should be agreed at the point of trade. It is also best practice to document this intention and the deadline for the reimbursement in the confirmation of the transaction, and for any reimbursement to be made on the business day immediately following the Repurchase Date. In any event, reimbursement should be made no later than 30 days after the Repurchase Date. It is also recommended that, where several reimbursements are to be claimed on the same day, they should be claimed in aggregate, rather than separately for each transaction. The aggregate claim per day should not be for less than EUR 500 or the approximate equivalent in other currencies.

1.2 Tom/next-indexed repos

If a tom/next index (TN) such as TOIS is used instead of an OI, because a tom/next rate is fixed one day in advance of the day to which it applies, there is no problem about sending the necessary settlement instructions to the relevant (I)CSD in time for the repurchase to be made on the Repurchase Date. Therefore, only Method 1 should be used.

1.3 Term rate-indexed repos

Some floating-rate repos are linked to term indexes such as LIBOR and EURIBOR. In contrast to repos linked to OI or TN, it is convention to pay the repo rate at the end of each floating interest rate period, eg a repo indexed to 3-month LIBOR would conventionally pay a repo return every three months. This means that the Repurchase Price is reset at the start of each new floating interest rate period, when the index is re-fixed.

The start of each floating interest rate period is fixed using the convention applied elsewhere in the money market and in the market in interest rate swaps. For periods which are multiples of one month, the start of future periods will be on the same date in the relevant future month as the Purchase Date, unless that future date is not a business day, in which case, the Modified Following Business Day convention will apply. This is in order to stop the day counts of later interest rate periods being compressed by the deferral of the starting dates of earlier periods because of the occurrence of non-business days. By way of example, consider a 3-month floating-rate repo indexed to 1-month LIBOR with a Purchase Date of 25 November 2012. The final Repurchase Date will be 27 February 2013 (because 25 and 26 February are not business days). Because 25 December 2012 is not a business day, the start of the second interest rate period will be deferred until 26 December 2012. However, the third interest rate period will be on 25 January 2013.

The method of calculating the Repurchase Price of a floating-rate repo should be confirmed ahead of trading. This can be done in the form of an agreed term sheet for each floating-rate transaction. The European Repo Council is currently considering a Term Annex for the GMRA 2011.

Periodic payments of repo return may raise legal issues, on which parties should seek an opinion.