

# Portfolio (macro) hedge accounting

## Cancelled swaps creating amortisation challenges?

### ALMIS has the solution

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#### 1. Introduction

An IASB 2014 Discussion Paper proposed a new approach to macro hedge accounting but it seems that initiative is being taken no further; and it will be some considerable time before any other paper emerges. In the meantime, the market continues to grapple with the application of the IAS 39 standards and guidance. Recent events in the market have highlighted certain specific considerations which can arise where swap(s) which are the hedging instrument in the hedging relationship are cancelled. This article considers an imaginary swap cancellation scenario, highlights the considerations a bank would face in the scenario, and explains how the ALMIS hedge accounting module provides a solution.

#### 2. Circumstances

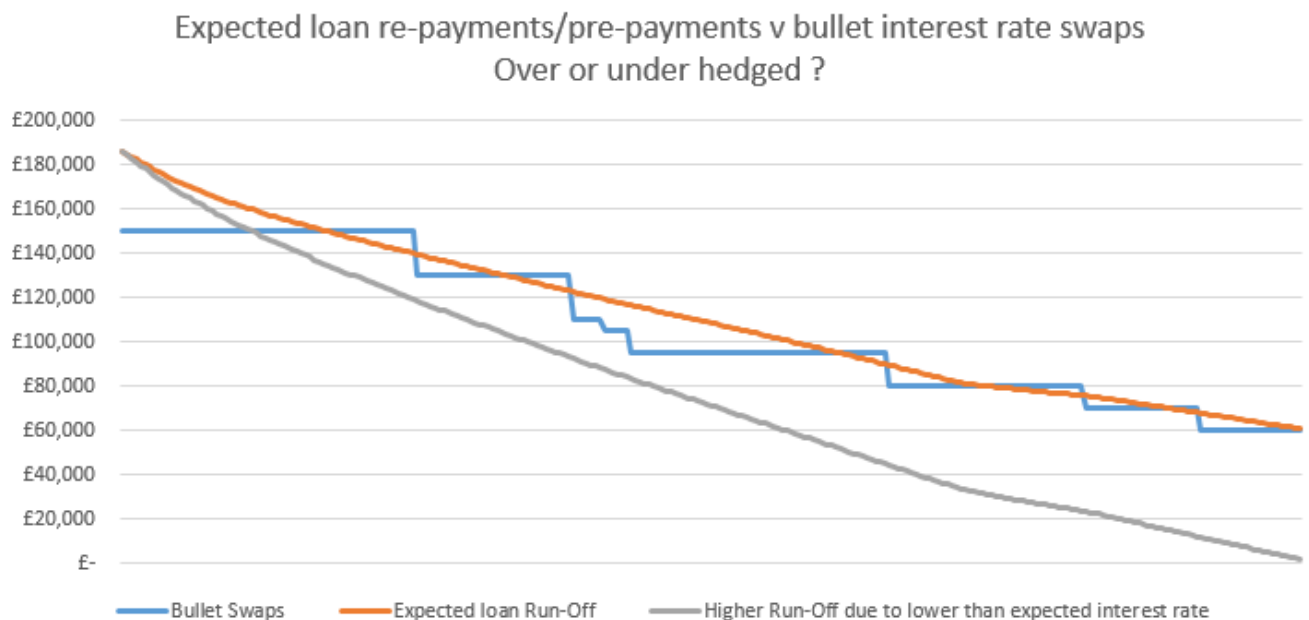
Consider the position of the Bank in the following scenario: -

- The Bank lends long term fixed loans when long term rates are comparatively high, say above 4.5%
- Some of the loans are repayment, but all are prepayable
- The Bank takes out a range of pay fixed receive floating interest rate swaps to hedge these loans; this hedging is based on an analysis of wide repricing time periods.
- The Bank adopts fair value portfolio hedge accounting in relation to its interest rate risk on this portfolio of fixed rate loan assets
- Interest rates fall sharply, and so the swap fair values are showing a significant liability offset by significant fair value adjustment to the hedged item asset.
- the swaps have a break option and are cancelled (for whatever reason), requiring de-designation of the relevant hedging relationship. The swaps are effective when they are cancelled and therefore the Bank will consider how best it now hedges the asset positions going forward, possibly by taking on new hedges for these positions
- at this point of de-designation, the carrying amount of the relevant loan assets includes a fair value adjustment which is material in amount; and under IAS 39 para 92 that fair value adjustment is amortised using a straight-line method

- over the subsequent years the loan assets experience significantly higher than expected pre-payments and the actual loan asset fair value is materially less than the carrying amount resulting from straight line amortisation, (potentially resulting in the need for an extra ordinary adjustment)

One of the most fundamental issues here is that the items being hedged are amortising (repayment / pre-payable) loans and the pattern of expected pre-payments can change due to interest rate changes, whereas the interest rate swap is not amortising and the swap nominal remains in full regardless of actual behaviour of the loan re-payment. This type of hedging is normal in the banking industry. Treasurers will examine the expected behaviour, take out hedges which broadly off-set the positions, and then adjust the hedging position from time to time as the position and expectations change. In this case, the hedge is however cancelled after only a few years, and the swap counter-party is paid in full based on the swap fair value at the time (which happens to be a large negative). The swap fair value and breakage cost is based on the yield curve at the time, which has fallen since the swap was taken out, but is still showing that the market is expecting short term interest rates to rise from very low levels. Following on from the cancellation, interest rates continues to fall further and pre-payments are far higher than originally expected.

### Analysis of a hedged portfolio of pre-payable long term fixed rate loans



## 3. Considerations

### 3.1 The amortisation requirement

In our scenario (cancellation of swaps) the designated swaps are de-designated and the corresponding fair value adjustment in relation to the hedge item needs to be amortised to profit and loss. But on what basis? IAS 39 Paragraph 92 suggests the bank should amortise using the effective interest method, but if “a recalculated effective interest rate is not practicable” the amortisation should be on a straight-line method.

### 3.2 Straight line vs Effective Interest

The straight-line method is well recognised and will typically result in a similar amount being amortised period to period. However, there are several important features of the effective interest method to bear in mind. The effective interest method is designed to reflect how and when interest is being earned, therefore:

- Clearly more interest is earned when the principal, or nominal amount of the relevant loan is higher, and less interest is earned when the nominal amount is lower. For a pre-payable repayment pool of loans, the principal balance accruing interest is far higher at the start and will reduce over the period of the fixed term. If designation is based on narrow time periods, eg monthly, then the straight-line amortisation can be performed for each time-period and the impact of this is minimal, whereas if designation is based on wider time periods, the impact of a reducing balance will be more material and the straight-line method less reliable.
- In the scenario envisaged the loan hedge item has a large premium, ie at the time the hedge is cancelled, the fair value of the hedged item is positive as the fixed rate on the loan (designated hedged item) is higher than the market interest rates. As the yield curve is positive at that time, the market is expecting interest rates to rise over time. Therefore, this premium rate (difference between the fixed rate and market expected rate) will be higher in the earlier years than in later years.
- The premium (fair value) is calculated by discounting future cash-flows. The discount rate is higher (closer to 1) in the earlier years reflecting that it is economically more beneficial to receive this premium amount sooner rather than later and therefore the EIR method shows a higher amortisation of the premium in the earlier years.

All three of these components have the effect that there can be a material difference between straight line and effective interest basis.

In Appendix 1 we show the difference between amortisation methods, and that this difference can be material, especially when the yield curve is not flat.

### 3.3 Impact of higher/earlier than expected pre-payments

The differences above are exacerbated even further when we observe higher than expected loan pre-payments as interest rates fall further and borrowers forfeit penalty interest to refinance these loans at far lower rates.

There is some confusion with the language used in IAS 39, for example IAS 39 AG 128.

*Items that were originally scheduled into a repricing time period may be derecognised because of earlier than expected prepayments or write -offs caused by impairment or sale.....*

It is the word 'may' that concerns us. It must mean 'should' otherwise the standard is saying we can include assets on the balance sheet that have been sold and don't exist. But then perhaps it is saying 'may' to allow for impracticalities?

Behavioural prepayment experience rarely follows expectations closely. Regardless of which amortisation method is used, the accounting profession seem unanimous that a bank should on an ongoing basis be reviewing the behavioural prepayment experience and adjusting the amount amortised accordingly. Also, the Bank should take account fully of any actual pre-payments, so that there are no circumstances where the amortised amount includes loans that have already been sold, pre-paid or have become impaired. In the scenario envisaged the loan assets do experience significantly higher than expected pre-payments mainly because of a significant fall in interest rates.

With a review of prepayment actual experience and a review of future expectations continually ongoing, a regular adjustment of the amounts amortised needs to take place. This is however a significant system challenge when the amounts being amortised cannot be specifically identified and tracked. The system impracticalities that allow straight line amortisation in the first place mean that it may also be impractical to account for any higher than expected pre-payments that will arise.

## 4. Some conclusions

If the prepayment experience does prove higher than expected and occurs over successive reporting periods but is not regularly reflected by adjustments to the amortised amounts in the relevant reporting periods this could result in the need for a material extraordinary adjustment.

### 4.1 Different amortisation methods, different results

In the scenario envisaged the fair value adjustment to be amortised is a significant one, as the swaps are long term and interest rates have moved, and furthermore the pre-payments post adjustment are higher than originally expected.

Straight line amortisation is always an approximation however in this case the straight-line method materially misrepresents the financial position.

A fair value amount is a complex calculation as the market yield curve used to measure the fair value is based on market expectations of future interest rates, and these future interest rates are not constant over time. For example, in 2012 the £ yield curve was significantly positive, ie the market expected interest rates to rise gradually over a long period. The lower the rate, the higher the value of a fixed loan. In year 1 the expected market rate was lower than year 2 and so on. As the fair value is calculated based on expected rates as well as expected amounts, the fixed loan fair value will be higher in the earlier periods than it would in later periods. For a positive yield curve, the EIR amortisation of the fair value would give a higher amortisation amount in earlier years than later years when rates were expected to rise. (See Appendix 1)

The true position is even more complex in practice, as the actual and expected pre-payments will inevitably change over time, and to be true to the principles of hedge accounting detailed in IAS 39, the amortisation should therefore change as actual and expected pre-payments and even loan impairments change.

#### 4.2 The need for granular loan data

This article has already recognised that in the sort of scenario envisaged the bank needs to conduct an ongoing review of both the behavioural prepayment experience and any impairments, and to adjust the amount being amortised accordingly. This cannot be done without granular data showing the actual experience of the portfolio loans over the percentage of loans that were originally designated.

#### 4.3 Confusion of concepts

Regardless of any impracticalities, there is confusion over key concepts. IAS 39 brought in the concept of fair value accounting that were hitherto historic cost or amortised cost. Amortised cost is one thing and fair value is another. An issue here is that in attempting to conduct a fair value approach, we need to use an amortised approach for any fair value adjustments, and this is inherently confusing. There are circumstances, due to changing interest rates, where the amortised adjustment on a balance sheet has a positive value whereas the item it relates to has no economic value or becomes negative in true value. A fair value item can go up or down as interest rates change however the fair value adjustment will only reduce, regardless of future changes in interest rates. The value presented on the balance sheet can therefore be difficult to understand. This is perhaps one of the difficulties the IASB are having in replacing macro hedge accounting is IFRS 9.

## 5. A solution, using a matching methodology

We have specialised in macro hedge accounting since its outset in 2005 and focus on specific hedging practices used by lending institutions. Whilst we support conventional re-pricing time period approaches to hedge accounting used by many firms and documented by accounting firms, we have always offered an alternative approach using a specific matching methodology

Re-pricing time-period approach

Re-pricing time-period	M1	M2	M3	.....	Mxx
<b>Loans</b>	x	x	x		x
<b>Swaps</b>	y	y	y		y

Effectiveness is then measured for each time-period.

With this approach the re-pricing amounts for each time-period is calculated from parts of different loans and swaps. If we use narrow time periods then often effectiveness cannot be demonstrated as the bullet swap is re-pricing in only one period against a loan that will re-price in many. Firms can get around this by performing the analysis in wider time-period, however this can lead to inaccuracies when performing fair value calculations. As discussed above accurate EIR and fair value calculations are often not practical using this approach. It can become impractical to track the movement of the individual loans as they are sold or become impaired from one period to the next.

To allow an accurate and practical calculation and EIR amortisation adjustment and to track and therefore account for actual impairments or sales or earlier than expected pre-payments we developed a matching methodology to demonstrate effectiveness where the system will automatically match entire loans to swaps based on their entire fair value off-set due to changes in interest rates.

ALMIS matching methodology

100% Loan 1 Maturity 31/12/xx

100% Loan 2 Maturity 31/12/xx

Analysis of expected cash-flows;

	<b>Loan cash-flow</b>	<b>Swap Cash-flow</b>
<b>M1</b>	x	y
<b>M2</b>	x	y
<b>M3</b>	x	y
.....		
<b>Mxx</b>	x	y
<b>Total PV</b>	x	y

The analysis is performed by measuring a total PV from each entire loan and comparing this with the PV of designated swaps, where hedge effectiveness can be demonstrated by calculating the change in PV of the loan will off-set a change in PV of the Swap. The fair value of the hedged item is based on the loan PV which can be measured using the rate of the matched swap, giving a closer off-set.

The methodology allows consistent and documented ways to match entire loans to swaps that are effective; and in addition the methodology applies the hedged (fixed swap) rate to the matched loan.

By keeping a record of the individual loan unique reference (eg account number) and the hedged rate, it is practical for our system to track the behaviour (eg pre-payment, sale, impairment) of the designated hedged amount from period to period. As demonstrated in Appendix 2, the amortisation of the hedge item amount is based on an accurate EIR method, but also takes full account of earlier than expected loan prepayments, sales and impairments, which can be removed in the periods they occur. As demonstrated in the example, the amortisation amount is calculated, using the EIR method, to be £2,241,743 (It is £1,621,458 using a straight-line method), yet when we take account of actual sales, earlier than expected pre-payments and impairments in the year, the annual amortisation amount is correctly stated as £4,051,897 and the lower hedged item amount can be correctly stated on the balance sheet.

This differs from the repricing time-period methods where the PV's and effectiveness are measured based on the analysis of a total nominal amount or cash-flow for each 're-pricing time-period'

This matching methodology attempts to more closely approximate the micro approach to hedge accounting, and at the same time provide the advantages of the portfolio approach, eg take account of dynamic hedging, a single effectiveness test and journal.

For our cancelled swaps, we will know which entire loans are designated and therefore are to be de-designated from the portfolio and amortised to P/L. As we have the terms of each entire loan, we can perform this amortisation so that it does not overstate the fair value hedged item on the balance sheet, and

releases this item to P/L as the fixed loans are repaid. The fair value hedged item is realised based on the expected forward rates used to calculate the swap breakage, and to take account any actual pre-payments or impairments as they arise.

## 6. Conclusion

The circumstances of our scenario demonstrate that designation by re-pricing time buckets and the straight-line amortisation method can lead to an extra ordinary adjustment in the reported accounts due to an over statement of the true economic position in previous years. The complexities of portfolio hedge accounting can make it impractical to calculate the true economic value of the hedge item being de-designated from period to period. Straight line amortisation adjustments are therefore to be discouraged, especially when the hedge item amount being straight-line amortised is material.

However, by adopting a matching methodology this straight-line method can be completely avoided and therefore there will be no chance of further extra ordinary adjustments. The P/L will reflect the true economic write-off of the designated hedge item amount, as the entire hedge item can be tracked and measured accurately from period to period.

Whilst this method is not prescribed specifically in IAS 39, it does meet all the criteria set out in AG 114 – 132, and therefore should be used when it is possible, and therefore avoid material misstatements and adjustments associated with accounting based on re-pricing time buckets and straight line amortisations.



## Appendix 1

### EIR v Straight line amortisation

#### Simple Example, with a rising yield curve

Fixed loan @ 4% - repaid over 6 months

#### ALMIS Method value entire loan / amortise using EIR

Month	Opening Balance	Designated Fixed Rate	Zero Coupon Spot	Discount Rate	Market Implied Forward (MIF)	Fixed Cash-flow	Market Implied Cash-flow	Premium	Discounted Premium	ALMIS Method value entire loan / amortise using EIR	
										$(1 / (1 + r^n / \text{days}))$	$(DRs/DRt) - 1 * \text{Days}/t$
1	£100,000.00	4.00%	1.00%	0.9992	1.0000%	333.33	83.33	250.00	249.79		
2	£83,506.10	4.00%	1.25%	0.9979	1.4988%	278.35	104.30	174.06	173.70		
3	£66,943.48	4.00%	1.50%	0.9963	1.9958%	223.14	111.34	111.80	111.39		
4	£50,311.85	4.00%	1.75%	0.9942	2.4907%	167.71	104.42	63.28	62.91		
5	£33,610.92	4.00%	2.00%	0.9917	2.9826%	112.04	83.54	28.50	28.26		
6	£16,840.40	4.00%	2.25%	0.9889	3.4711%	56.13	48.71	7.42	7.34		
									<b>633.39</b>		

} monthly amortisation under EIR method

Fair Value Adjustment  
(premium over loan balance)

#### Re-pricing time bucket - sum of digits straight line amortisation

Month	Opening Balance	Re-pricing Gap	Fair Value per time bucket (see calc below)	M1	M2	M3	M4	M5	M6	
1	£100,000.00	£16,493.90	41.20		41.20					
2	£83,506.10	£16,562.62	75.82		37.91	37.91				
3	£66,943.48	£16,631.63	103.81		34.60	34.60	34.60			
4	£50,311.85	£16,700.93	125.13		31.28	31.28	31.28	31.28		
5	£33,610.92	£16,770.52	139.75		27.95	27.95	27.95	27.95	27.95	
6	£16,840.40	£16,840.40	147.67		24.61	24.61	24.61	24.61	24.61	
				<b>633.39</b>	197.56	156.36	118.45	83.84	52.56	24.61

Month	Opening Balance	Designated Fixed Rate	Zero Coupon Spot	Discount Rate	Market Implied Forward (MIF)	Fixed Cash-flow	Market Implied Cash-flow	Premium	Discounted Premium
1	£16,493.90	4.00%	1.00%	0.9992	1.0000%	54.98	13.74	41.23	<b>41.20</b>
1	£16,562.62	4.00%	1.00%	0.9992	1.0000%	55.21	13.80	41.41	41.37
2	£16,562.62	4.00%	1.25%	0.9979	1.4988%	55.21	20.69	34.52	34.45
									75.82
1	£16,631.63	4.00%	1.00%	0.9992	1.0000%	55.44	13.86	41.58	41.54
2	£16,631.63	4.00%	1.25%	0.9979	1.4988%	55.44	20.77	34.67	34.59
3	£16,631.63	4.00%	1.50%	0.9963	1.9958%	55.44	27.66	27.78	27.67
									<b>103.81</b>
1	£16,700.93	4.00%	1.00%	0.9992	1.0000%	55.67	13.92	41.75	41.72
2	£16,700.93	4.00%	1.25%	0.9979	1.4988%	55.67	20.86	34.81	34.74
3	£16,700.93	4.00%	1.50%	0.9963	1.9958%	55.67	27.78	27.89	27.79
4	£16,700.93	4.00%	1.75%	0.9942	2.4907%	55.67	34.66	21.01	20.88
									<b>125.13</b>
1	£16,770.52	4.00%	1.00%	0.9992	1.0000%	55.90	13.98	41.93	41.89
2	£16,770.52	4.00%	1.25%	0.9979	1.4988%	55.90	20.95	34.96	34.88
3	£16,770.52	4.00%	1.50%	0.9963	1.9958%	55.90	27.89	28.01	27.90
4	£16,770.52	4.00%	1.75%	0.9942	2.4907%	55.90	34.81	21.09	20.97
5	£16,770.52	4.00%	2.00%	0.9917	2.9826%	55.90	41.68	14.22	14.10
									<b>139.75</b>
1	£16,840.40	4.00%	1.00%	0.9992	1.0000%	56.13	14.03	42.10	42.07
2	£16,840.40	4.00%	1.25%	0.9979	1.4988%	56.13	21.03	35.10	35.03
3	£16,840.40	4.00%	1.50%	0.9963	1.9958%	56.13	28.01	28.13	28.02
4	£16,840.40	4.00%	1.75%	0.9942	2.4907%	56.13	34.95	21.18	21.06
5	£16,840.40	4.00%	2.00%	0.9917	2.9826%	56.13	41.86	14.28	14.16
6	£16,840.40	4.00%	2.25%	0.9889	3.4711%	56.13	48.71	7.42	7.34
									<b>147.67</b>

