Constant Yield Amortisation

PURPOSE

To illustrate the model and formulae for calculating amortization of premium (accretion of discount) amount that will generate a constant yield when a bond is held to maturity.

WHY IS THIS IMPORTANT?

Carrying value for bonds where bonds held to maturity needs to be stated in the financial statement at amortized (accreted) price that gives a constant yield to maturity.

PROCEDURE

- 1. CS Lucas provide an amortization (accretion) schedule for bond that are held to maturity.
- 2. This guide explain using an excel model how this schedule is computed.
- 3. Consider a bond with the following parameter

Issue Date 15-Jul-14

Maturity Date 15-Jul-16

 $Coupon \ 1.2\% \ semi-annually$

- 4. This bond was purchased at a price of 100.10 on 24-May-16.
- 5. We explain the construction of a model to 1) compute the constant yield amount that is required to amortized the carrying value from 100.10 on 24-May-16 to 100.00 on 14-Jul-16. The convention of amortizing from the first day but not the last.
- 6. The model

| Issue Date | 15-Jul-14 Tue | | | | | |
|--------------------------|-----------------|-------------|-------------|--------------|--------------|-------------|
| VDate | 24-May-16 Tue | | | | | |
| Maturity | 15-Jul-16 Fri | | | | | |
| Coupon | 1.2000000% | Coupon | | | | |
| Constant Effective Yield | 0.4978232% | Y | | | | |
| Fair Value | 100.1000000 | | | | | |
| | | Α | В | С | D | Е |
| Date | Days from VDate | Opening | Yield | Coupon | Amortization | Closing |
| 24-May-16 Tue | - | 100.1000000 | 0.001365263 | 0.0032877 | -0.001922408 | 100.0980776 |
| 25-May-16 Wed | 1 | 100.0980776 | 0.001365237 | 0.0032877 | -0.001922434 | 100.0961552 |
| 26-May-16 Thu | 2 | 100.0961552 | 0.001365211 | 0.0032877 | -0.001922461 | 100.0942327 |
| 12-Jul-16 Tue | 49 | 100.0057712 | 0.001363978 | 0.0032877 | -0.001923693 | 100.0038475 |
| 13-Jul-16 Wed | 50 | 100.0038475 | 0.001363952 | 0.0032877 | -0.001923720 | 100.0019237 |
| 14-Jul-16 Thu | 51 | 100.0019237 | 0.001363925 | 0.0032877 | -0.001923746 | 100.0000000 |
| | | | Total | Amortization | -0.10 | F |

| Item | Explanation |
|---------------------|---|
| Coupon | 1.2% pa |
| Fair Value | The clean purchase price of the bond. 100.10 |
| Effective Yield (Y) | This is the value that is determined using goal seek function in the spreadsheet. This value is used in the model in (B). |

| Row 1 – 24 May 16 | | | | |
|----------------------|--|--|--|--|
| Item | Explanation | | | |
| Opening (A) | This the opening carry value before the daily amortization. | | | |
| Yield (B) | This is the daily gross yield, | | | |
| Coupon (C) | This is the daily coupon income. | | | |
| Amortization (D) | Part of the gross yield on the bond is attributable to the coupon (C). The rest is attributable to amortization. | | | |
| Closing Value (E) | | | | |

| Row 2 – 25 May 16 | | |
|-------------------|--|--|
| Item | Explanation | |
| Opening (A) | This the closing value (E) of the previous row (Row 1) | |

| Item | Explanation |
|------------------------------|--|
| Total Amortization (F) | This is the sum of the Amortization column (D) |

7. The goal seek

The goal seek will set cell Total Amortizisation (F) = 0.1

This is the premium to discount By changing cell Effective Yield (Y)

8. Model for accretion.

| | | А | В | С | D | E |
|---------------|-----------------|-------------|-------------|-----------|-------------|-------------|
| Date | Days from VDate | Opening | Yield | Coupon | Accretion | Closing |
| 24-May-16 Tue | | 98.0000000 | 0.041337056 | 0.0032877 | 0.038049385 | 98.0380494 |
| 25-May-16 Wed | 1 | 98.03804938 | 0.041353105 | 0.0032877 | 0.038065434 | 98.0761148 |
| 26-May-16 Thu | 2 | 98.07611482 | 0.041369161 | 0.0032877 | 0.038081490 | 98.1141963 |
| 12-Jul-16 Tue | 49 | 99.88341937 | 0.042131495 | 0.0032877 | 0.038843823 | 99.9222632 |
| 13-Jul-16 Wed | 50 | 99.92226319 | 0.042147879 | 0.0032877 | 0.038860208 | 99.9611234 |
| 14-Jul-16 Thu | 51 | 99.9611234 | 0.042164271 | 0.0032877 | 0.038876599 | 100.0000000 |

FREQUENTLY ASKED QUESTIONS

RELATED INFORMATION

Constant Yield Amortization/Accretion Model

CHANGE HISTORY

| Date | Ву | Changes |
|-------------|----|--|
| 20-Jul-2016 | CS | Created. |
| 13-Dec-2016 | TS | Updated. Typo in para 5. Changed 100.28 to 100.10. |